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October 1989

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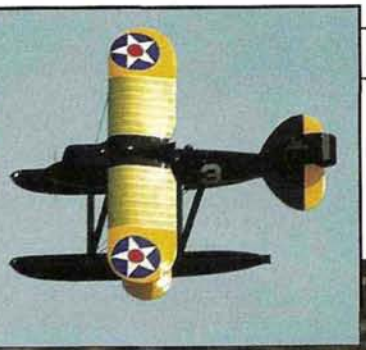
43-Year-Old SWOOSE!!



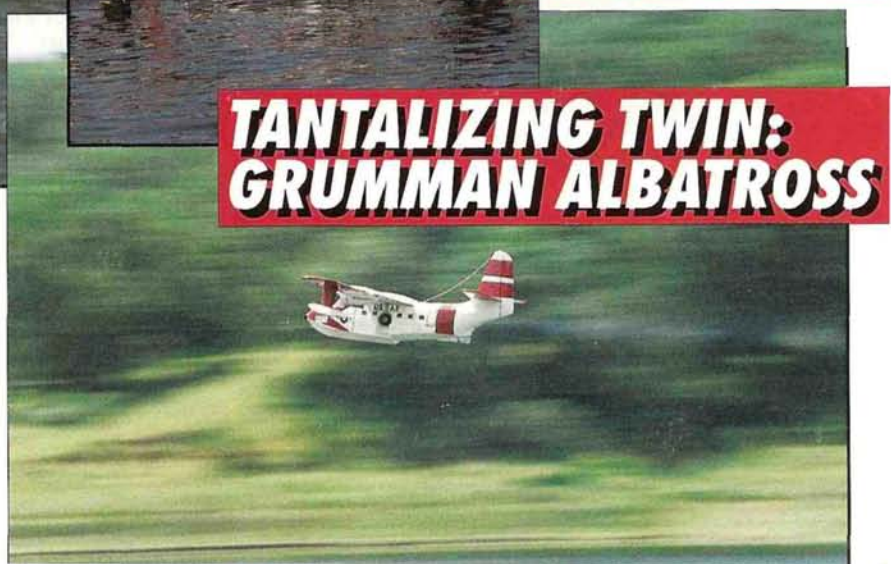
EVENTS:
CLEARLAKE '89
ACE FLOAT FLY

3 CONSTRUCTION PLANS

SEAPLANES!

HOW TO:
PLUG CADDY

TANTALIZING TWIN:
GRUMMAN ALBATROSS



BUILD A BEAVER!

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MODEL AIRPLANE

FEATURES

CONSTRUCTION

HELICOPTER SECTION

COLUMNS

DEPARTMENTS

ON THE COVER: The collage on the cover of our third annual seaplane issue captures the broad spectrum of R/C airborne aquatic activities; everything from scale, sport, classic, vintage, to contemporary planes. If that's not enough, we've also reported on an R/C jet seaplane! All we'd need to complete the theme would be a set of pontoons for our Kyosho Concept 30 heli so that it could hover over it all! Chromes by Messrs. Sullivan, Westwood, Martin and Uravitch.

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Editorial

by RICH URAVITCH

JUST LAST MONTH, we were talking about 60 years of aeromodeling and *MAN*. We spoke of a number of things that have become traditions with us. What we didn't point out, or even recognize, were the *new* ones we had started; this Seaplane Issue is one of them. This is the third annual installment, and it's particularly significant to me, personally, because the first one we did was the first Editorial I ever wrote as a member of the *Model Airplane News* team.

That was almost two years ago. Time, like one of the basic ingredients of our sport, sure flies! So what's happened to Aeroplanus Aqueous over that period? Plenty! The Annual Clearlake bash continues to grow in size, participation and significance—so much so that the Lakeport city administration has developed the site and the event as a permanent fixture for R/Cers and spectators to enjoy. *MAN* has even been included in a 50-year time capsule (I sure hope they invite *me* to the opening!). Giant-scale R/C seaplane activity of unequalled proportions will take place later this year at the Schneider Cup enactment to be held at Lake Havasu, NV. This event, spark-plugged by Bob Martin, will surely be one of the most exciting scale meets ever.

It's easy to see that flying off water has made many new converts; not surprisingly, the manufacturers have responded to the need by making available a broad selection of floats that will work on virtually any model we're ever likely to build. For you more committed types, kits of strictly amphibious birds are also available. Forward thinking, unique designs? You bet! Like the Sea Era featured in this issue and James Gilgenbach's ducted-fan scale Convair Sea Dart, which John Sullivan talks about in his column.

There's a lot packed into this issue, and, as is frequently the case, a number of the things we planned just didn't make it. Like the F&B on Ace's All Star Bipe on their vacuum-formed floats; or Global's EZ .25-size floats (the smaller version of the .40 size we did last year). They'll be along shortly.

The Westwood D.H. Beaver and the Ziroli '89 Swoose should satisfy the needs of you scratch-builders; if not, take a look through our plans list to find something you can get started with. Nearly any design that works as a land plane will work as well as a seaplane; the only *real* difference is probably that the "runway" is bigger!

We've really enjoyed putting this issue together for you; if you liked it, let us know; if you didn't, tell us anyway!! ■

Rich

MODEL AIRPLANE NEWS

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Airwaves

WHERE TO WRITE TO US

If you're writing to the editors (and we'd love to hear from you), please be sure to address your letters to "Airwaves" *Model Airplane News*, 251 Danbury Road, Wilton, CT 06897. Only subscription orders and inquiries are handled by our Customer Service Department in Mount Morris, IL; other mail addressed there must be forwarded to Connecticut, and this leads to long delays.

We Goofed!

In our "Top Gun" '89 coverage in August's issue, we showed Mike Mas doing his outstanding heli demo. We said he was flying a Miniature X-Cell, but, as we all know, he has hooked up with Robbe and was flying their new Magic. Sorry, Ted; sorry, Frank; sorry, sharp-eyed readers!

Baffled Belgique

I'd be much obliged if you agree to help me solve a little mystery:

Having been a subscriber to *MAN* for some years in the past, I had once noticed an advertisement by Goldberg concerning a plastic backplate/fire-wall/intake-valve/replacement unit designed to fit Cox .049 engines.

As it happens, I need a number of these sets. I consequently wrote to Carl Goldberg to inquire about them, but I have never received a reply. Could you please inquire into the matter and let me know about your findings?

CLAUDE GOFFIN
Rue Emmanuel Mertens, 36/Bte 6
Bruxelles, Belgium

Claude, the handy little nylon item you're seeking has been out of production for a number of years, but I'd almost bet that nearly every modeler has one stashed in his "things-I'll-eventually-need" box. Unfortunately, I've lost my entire box with that label! C'mon guys; one of you must have one of these things to help Claude out!!

RAU

Dutch Ducted Fan

I've been a subscriber to *MAN* for two years, and I love the magazine! The last issue about ducted-fan jets was truly fantastic! After flying for some years with speed models, I want to try a ducted-fan model, but here in the Netherlands, there aren't that many models to choose from. Who can help me with a drawing or a copy of the Supersonics Predator? (I want a balsa-and-foam model because it's cheaper and easier to repair than a fiberglass-and-foam model.) I'm willing to pay for it. I already have a Dynamax fan and an O.S. 77 engine for propulsion.

Again, many thanks for your assistance.

VINCENT TJIN A. DJIE
Lavendelhof 10
4907 AV Oosterhout
The Netherlands

Vincent, glad to see that fan activity is increasing in the Netherlands. It's obviously alive and well throughout Europe, as I discovered on my recent visit to England for a fan fly. We've contacted Supersonics and will try to get a set of plans for you, but have also printed your address, in case some of our readers can help.

RAU

Where are the Civilian Jets?

In the early '70s, I bought a model called a "Sherwood" Gates Lear jet. The kit isn't a ducted fan, but I guess in a high-speed low pass you wouldn't be able to tell the difference. The kit is half-finished owing to circumstances beyond my control (too busy). After seeing all these new ducted-fan models, I started to wonder where the civilian jet models are? All you see now are military jets. Doesn't anybody care to remember those famous business jets like the Lear, the Cessna Citation, the

(Continued on page 10)

Airwaves

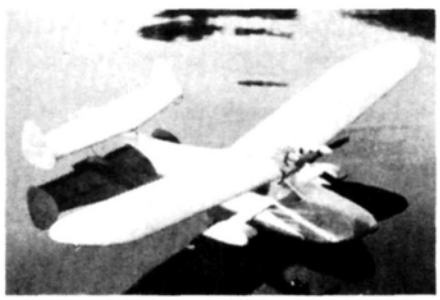
(Continued from page 8)

Gulfstream and the others? You rarely, if ever, see these jets in a kit form.

JAMES HICKS
Montville, NJ

Hold on, Dave. I remember the Lear you never quite finished, but I believe it was kitted by Sherlock Models, which also produced a prop-driven Boeing 727. You're quite right: When airborne, it was difficult to see the prop in the nose and, as I recall, they flew pretty well, but used a lot of molded plastic in the structure, and this contributed to their limited lifespans. Moving up to the present, however, two of the three bizjets you mention are, in fact, available in kit—or, at least, semi-kit form. Royal produces an all-wood, built-up Cessna Citation for the smaller RK-20 size units, while Hyatt Tech has a fiberglass semi-kit of Mark Frankel's Lear 35 available. It uses 5-inch-diameter fans like the Dynamax and Turbax units. Check out our April '89 "Jet" issue for additional information.

RAU



Drake Design

I recently learned that, in 1951, Ken Willard designed a small 1/2 FF flying boat called the Drake. The design was bought by Bill Winter, the editor of *MAN*, for publication, and it was on the top of your plans list for years. I wanted to order a copy of the Drake plans from you, but the list I just bought from you doesn't show it. Please let me know if you have the plan available and its cost, or I'd also be happy with a Xerox of the magazine article and plan either from your 1951 or 1952 issue. It flew with a K&B .049 and had a 36-inch wingspan. Help!

LOUIS BUFFARDI
Slidell, LA

Sorry, Lou. Some good news and some bad news: first, the bad news—the Drake plan is no longer available, although we've considered reviving it; the good news is that we've already sent you a photocopy of the article, which we hope helps. Send us some pictures of the results.

RAU

High Planes Info

In response to Mr. Oliver Fringer's letter "Heading for the High Ground," July, 1989:

La Paz's airport is at 13,156 feet. The city is at 11,152 feet. At this altitude, model engines develop only half their potential power; therefore, Mr. Fringer should get airplanes with half their weight or twice the power on the engines, and although using a higher-nitro-content fuel will perk up the power, it will help only slightly.

Also, remember that the air speed should be much higher to sustain flight. A sailplane will have no problems owing to optimal thermals (the sun heats the ground much faster at that altitude because the air is thinner), and mountain and plateau wind conditions are mild, without gusts.

I'm a self-taught R/C modeler since a few years back, although my home city is only at 1,440 feet above sea level, and I'm currently flying scale Byrons and scratch-builts, plus jets and helicopters. Everything I order is bought through catalogs

(Continued on page 12)

Airwaves

(Continued from page 10)

and a Miami representative of my cane sugar and alcohol plant.

Mr. Fringer can call me once he arrives in LaPaz at 033-35119(office) and/or 033-36218(home) if he wants any more help and guidance to the La Paz air modeling club.

EDUARDO GUTIERREZ SOSA
Santa Cruz, Bolivia

Eduardo, thanks for providing the information on R/Cing in LaPaz. I'm sure Mr. Fringer appreciates it and will probably convey his thanks personally.

RAU

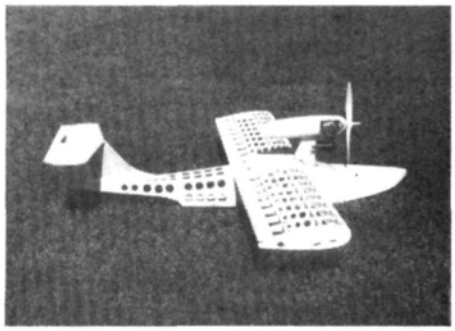
Skylark Search

I'm new to R/C flying, having just completed my first plane. My problem is that a friend of the family just gave me a partially completed Goldberg Skylark 56 MKII. This is a bottom-wing sport plane with retract capability. As I look through many catalogs and magazine advertisements, I'm not able to locate it. Has is been discontinued? Any information you can give me about the plane will be greatly appreciated. Since I'm just learning to fly a high-wing trainer, I'm not planning to fly the Skylark soon, but i'd like to start building it.

ALFRED A. NIMS
Scotch Plains, NJ

You might just be out of luck on this one, Al. The Goldberg Skylark 56 was essentially a low-wing version of their popular Falcon 56 and was available in two sizes, including one for 1/2A engines. The design has been replaced by the Sky Tiger. I suggest that you drop Goldberg a note explaining your problem; they might have the material you require. And, by the way, welcome to R/C!

RAU



Super Seamaster

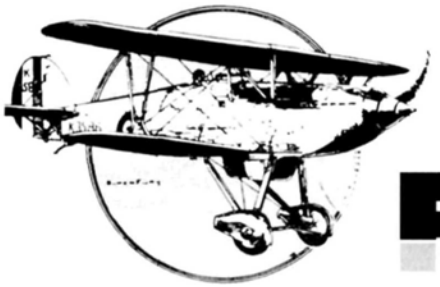
Your October '88 issue got me! Dick Purdy's review of the Seamaster 40—wow! Mine has a wing that's 8 inches longer and completely fiberglassed with Dan Parsons's cloth and K&B resin. Power is an O.S. 61 2-stroke. It weighs 8 1/2 pounds and is finished in orange, yellow and white. I bugged Ace for the 120 size shown at a Chicago show in November, and Tom Runge sent me the preliminary plans! No kit yet, though, but one, I understand, is coming! Pictures enclosed of my 120, which is Super Tigre 2500-powered with an 85-inch span. If you'd like details and more photos, just call or drop a note. If you get to the EAA Fly-In at Oshkosh, you can fly them both! (I'm 35 miles from Oshkosh.)

ART HERSCHBERGER
Princeton,WI.

There you have it, radio fans—an unsolicited letter from a reader who doesn't even know me but offers me a shot at flying both his seaplanes! Art, thanks for the offer, but you're safe for another year, at least, as I just returned from my annual trek to Oshkosh and had a great time, in spite of the weather. Your Seamaster looks great, and we hope you enjoy the rest of this, our annual seaplane issue.

RAU

We welcome your comments, opinions, and suggestions. Letters should be addressed to "Airwaves," **Model Airplane News**, 251 Danbury Road, Wilton, CT 06897. Letters may be edited for clarity and length.



Fifty Years Ago

by KATHERINE TOLLIVER

FIFTY YEARS AGO, the U.S. Army Air Corps threw a huge party to celebrate its 30th anniversary. More than 100 fighting planes from various stations and bases throughout the country took to the air, and 75,000 people gathered at Wright Field to pay tribute to America's supremacy in the air. Colonel Frank Lahm and Colonel Frederick Humphreys, the earliest of the "Early Birds," were there. These two officers were the first to fly in an army plane and the first students of the Wright Brothers. Reminiscing about his flight with Orville Wright, Colonel Lahm said that they remained in the air for 1 hour and 12 minutes—a world's record for 1909. Many others took the time to reflect on the Air Corp's humble beginnings.

In 1909, the U.S. Army purchased its first airplane from the Wright Brothers for $25,000. Built in their shop, this two-passenger plane had enough fuel for 125 miles and could remain in the air with this load for 1 hour at a speed of 40mph. With a wingspan of 40 feet and a wing area of 500 square feet, it weighed about 800 pounds. The 25hp 4-cylinder engine drove two 8 1/2-foot wooden propellers. Compare this with the 150-foot span of the Boeing B-15, with its four 9-cylinder 1500hp Wasp engines and its 3-bladed steel prop capable of turning over 25,000rpm or better, and it was easy to see why this progress had put the Air Corps in a festive mood.

Fifty years ago, the French were not celebrating. Their aviation industry was in turmoil as the country attempted to nationalize its aircraft industry. Eighteen individually owned aircraft companies lost their identities as the industry struggled to standardize tools and production facilities. The French were building fewer planes than any other major nation, but, amidst all this chaos, rose the Potez 63 Reconnaissance Bomber Fighter—"a startling machine, produced under the world's worst manufacturing conditions." By the fall of '39, the French had managed to build over 200 of these sleek fighters. Appearing on the October '39 cover in its natural aluminum color, the Potez is shown flying over Paris. The all-metal, low-wing full cantilever monoplane featured a "hi-low" fuselage-engine nacelle arrangement and dihedral horizontal stabilizers. With a wingspan of 52 feet, 6 inches and a length of 36 feet, 3 inches, it had a wing area of 355 square feet, and it could be converted into a C-3 hi-speed fighter, a B-2 heavy bomber or an R-2 observation plane.

A French test pilot took a Potez 63 up for a routine flight. At about 20,000 feet, he leveled off and headed east. What better time for a nap? With the throttle wide open, he strayed into German territory doing 320mph and he awoke to the sound of German guns. That little snooze put him about 20 miles from the heavily fortified city of Frankfurt. Needless to say, he made a very quick course correction and, no doubt, promised his superiors that he would make an effort to modify his sleeping habits. He later admitted that because his air speed indicator had been sealed, he had no idea that he was travelling so fast.

Carl Goldberg with his popular parasol gas plane.

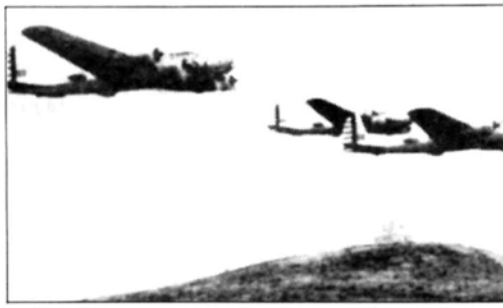
"Miss San Diego" performed beautifully with its inverted engine installation.

Modelers were told to buy the lightest indoor balsa wood for building the Gee Bee Sportster D. This indoor flying scale model was completely covered with microfilm and was supposed to weigh about 3/10 of an ounce (not including the rubber motor, which was another 4/10 of an ounce).

Microfilm sounds a little tricky. The fact that you need plenty of it, "just in case" is not a confidence-builder. "The secret to covering a round or oval fuselage with film is in rolling the wet body over the film slowly and, at the same time, while cutting the edges with the iron, noting that the tension is not too great in stretching the film." Got that? A good microfilm job involves "knowing how to control the shake in one's nerves." For those who didn't have the hands of a surgeon, it might have been best to go on to another construction article, like that on the Miss San Diego.

The San Diego was a small, stable parasol-type gas model that "performed beautifully" with an inverted engine installation. It had a wingspan of 4 feet, a wing area of 252 square inches and it weighed 1 pound, 2 ounces ready to fly with en-

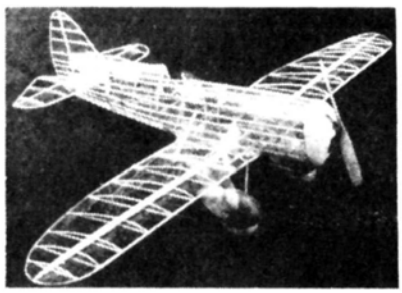
FIFTY YEARS AGO



Bombers over Wright Memorial at Kitty Hawk, NC, celebrating the Air Corps 30th anniversary.

gine. Almost any of the popular small engines could easily be adapted to this gas job by altering the design of the metal mounting plate located on the wooden beams. It flew for over 15 minutes on a 40-second motor run and had a "slow, lazy circling glide after the motor cut." Those who never wanted to see another piece of microfilm would have been happy with the San Diego's Mino Tissue—an "ideal covering material." The original model was covered with clear dope and painted a vivid orange.

News that the Curtiss Propeller Division had announced successful tests at Wright Field on the world's fastest four-blade controllable pitch propeller appeared in the "Flash News" column. Used on high-speed bombing and fighting craft, it was designed to absorb the power of 2000hp engines. High, heavy land gears and anti-torque and vibration mechanisms were eliminated as propeller diameter and high speed were kept to a minimum.



The indoor flying scale Gee Bee completely covered in microfilm.

It was also reported that Douglas's long-awaited B-23 Bomber had taken to the air on its maiden flight. This twin-engine bomber was powered by two 1450hp Wright, 14-cylinder double-row radials and it featured a tail gunner. The Air Corps ordered 38 of them at a cost of $5,266,420.

In 1939, there were 26,144 licensed pilots and 11,160 licensed aircraft in the United States. Clara Adams (one of the 761 licensed women pilots) circumnavigated the globe in 16 days, 19 hours, 4 minutes to set a new world record for the event. In 1928, she was on the first Atlantic trip of the Graf Zeppelin, and in 1936, she made the maiden flights of the Hindenburg and the giant 12-engine Dornier that flew from New York to Rio—quite the globetrotter!

The July '39 Nationals lived on in the October issue with photos by Harold Kalich. Carl Goldberg, "the gas-model wizard," was shown with his small parasol gas job. This type of plane predominated at the contest, since it had the greatest efficiency under the new class piston-displacement rule. The ship's design was based on the theory that high performance may be obtained by using a high-power engine and building the lightest plane possible around it. These little ships were a perfect example of a "motorized skyrocket." "They would stick their nose upward and climb in light spirals for several hundred feet in the short 20-second motor run allowed." As long as the nose remained lifted above the horizontal, it was very steady, but on several occasions, the planes went into a spin and crashed when they flew in a horizontal plane. Mr. Goldberg's planes crashed twice, but, on the whole, their performance was phenomenal.

MAN ran an ad featuring Goldberg's parasol-type Comet Zipper: "What a climb! 2,000 feet per minute! Features include detachable motor unit and battery track, "automatic pilot" wing mount, shock-proof wing and tail, finished motor lock fittings." It was yours for $3.95, plus 25¢ postage. (What a price!)

It took several issues of *MAN* before the excitement of the Nationals wore off, and by then, it was time to gear up for the next year. October's article about the National's ended on this enthusiastic note: "Long live model building as a hobby"—a great ending for any article in *MAN*. ■

Hints & Kinks

by JIM NEWMAN

SEALING YOUR TUB SEALANT

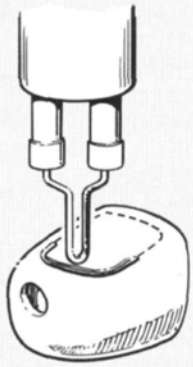
Even though you screw on the cap tightly, after a period of non use, you might still find that a plug of silicone has dried in the nozzle of the tube. To avoid this, our reader carefully scrapes a blade across the nozzle to remove any excess sealant; then he puts a small piece of clear cling-film wrap over the end, flush against the sealant, and he carefully squeezes out any air that's trapped under the plastic. He then replaces the cap as usual.

Albert Poon, Teluk Intan, Perak, Malaysia

L'EGGS WHEEL PANTS

These are like the pants used on the Curtiss Hawk and Fairchild 24. First, glue together the two halves of the L'eggs panty-hose container using something like Plasti Zap or Flex Zap. Carefully mark the fore and aft center line all around (I recommend 1/64-inch tape for this), then split the container 1/2 inch on each side of this line using a fine saw. True the edges on a sheet of sandpaper, then cut away the required wheel clearances. Now you can re-join the halves using a strip of glass tape inside and CA glue.

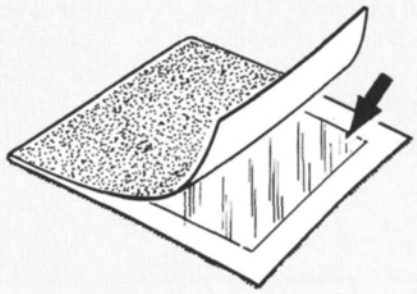
Joe Nichols, N. Creek, NY



HOT KNIFE FOR PLASTICS

This simple tool works very efficiently when trimming plastic cowls. Our reader inserted a convenient size of wire into his solder gun, and then he smoothly melted his way through the plastic just as easily as he cuts foam. The fine ridge left after the operation is easily removed with a hobby knife.

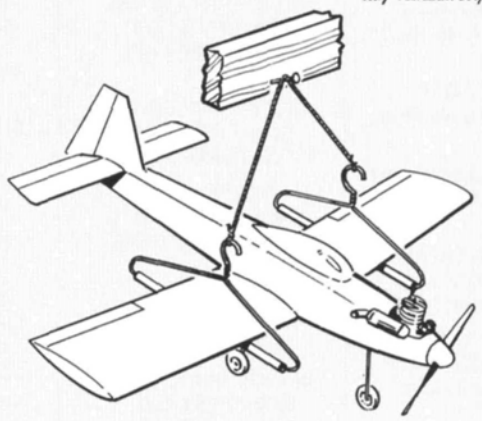
Alex Biliski, Dunnville, Ontario, Canada



SECURING FOLDED SANDPAPER

After being used for a short time, folded sandpaper usually starts to slip over itself, or "walk" as some modelers say. To cure this, put a piece of double-sided carpet tape inside the fold as shown.

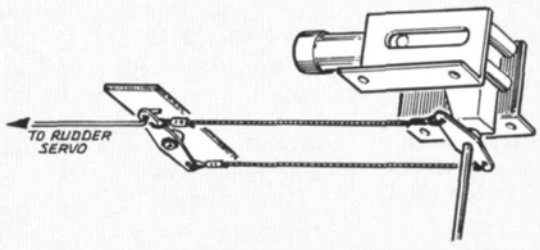
Ray Teliczan Jr., Millstadt, IL



HANGERS FOR AIRPLANES

This is a convenient way to hang your planes: Just slip a coat hanger under each wing. Don't use those rounded plastic hangers, because the hooks slowly pull open under the weight of a model. If you use wire hangers, use the sort with the card tube over the lower bar, especially if you value your finish. Be sure, too, to have the hangers parallel with the fore and aft center line of the model, or you'll warp your wings. (I know; I've been this route!). Bearing in mind these "don'ts," this is a great way to store your planes.

Jake Miller, North Battleford, SK, Canada



RETRACT STEERING LINKAGE

This is one way to connect Rhom-Air steerable retracting nose gears. The .018-inch standard steel control-line cable or nylon fishing line goes slack as the gear retracts, and this allows the centering spring to operate. The bellcrank to which the cables are attached is a cut-down 1/2A control-line bellcrank.

Carlos J. Forero, Bogota, Colombia, S. America

Model Airplane News will give a free one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Hints & Kinks." Send rough sketch to Jim Newman, c/o **Model Airplane News**, 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO, AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.

How To:

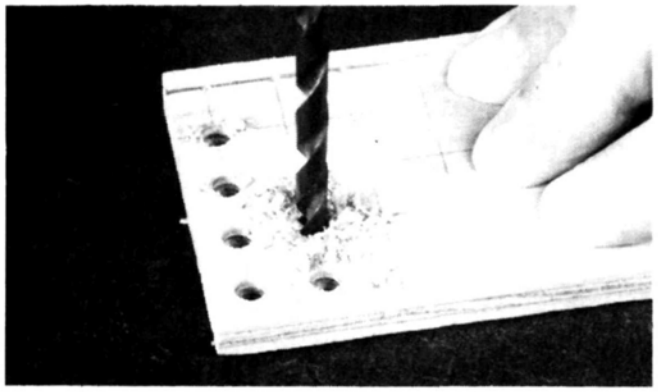
by RANDY RANDOLPH

MAKE A GLOW-PLUG CADDY

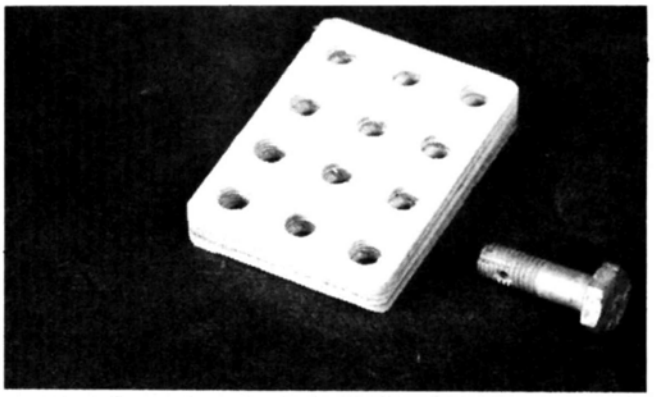
Since glow plugs seem to find their way to the bottom of your field box, a plug caddy is a good way to keep them together and organized. The photos show how to make one that holds a dozen plugs and can be attached to your field box in an easily reached place.

1. *Materials and tools needed: a 3x4-inch piece of 3/8-inch plywood, a 7/32-inch drill, a square, a pencil and a 1/4-28 bolt made into a tap.*

2. *Using the square, rule the plywood into a 1/2-inch grid. Allow 1/4-inch margins all around before marking the first line. Actually, any piece of hardwood thicker than 3/8 inch can be used in place of plywood.*

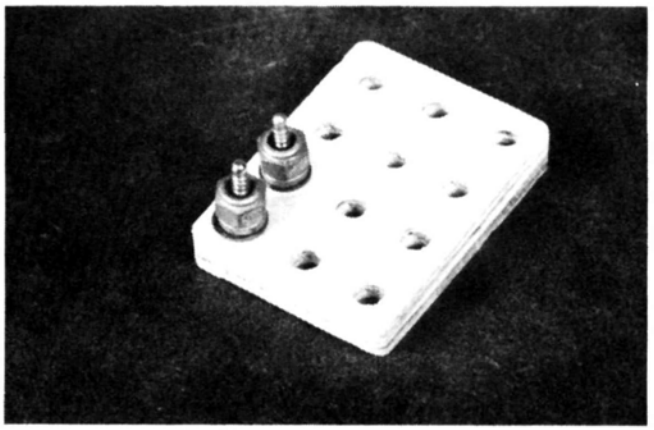


3. *Drill 7/32-inch holes through the plywood at the intersection of the grid lines. The caddy can be made larger to suit individual needs by extending the grid lines in either direction.*



4. *The holes are tapped with the 1/4-28 bolt that has been made into a tap by filing a V-shaped notch at right angles to the threads. (See June '89 MAN.)*

5. *Twist the tap through each hole. The threads on glow plugs are actually 1/4-32, but in the soft wood, the 1/4-28 bolt is a good alternative to a rather difficult-to-find tap size.*



6. *The completed caddy. Sections can be painted different colors to differentiate between long, short, standard, or idle-bar plugs for easy type identification.*

SPECIFICATIONS

Type: *Sport scale seaplane (adaptable to land)*
Wingspan: *70 1/4 inches*
Weight: *6.75 pounds (108 ounces)*
Wing Loading: *27 ounces per square foot*
Power Req'd: *.50 to .60 4-stroke; .40 to .50 2-stroke*
No. of Channels Req'd: *4 minimum; 5, if flaps are desired*
Materials: *Balsa and ply, conventional structure*

by ED WESTWOOD

A great model of deHavilland's "plane for all seasons"

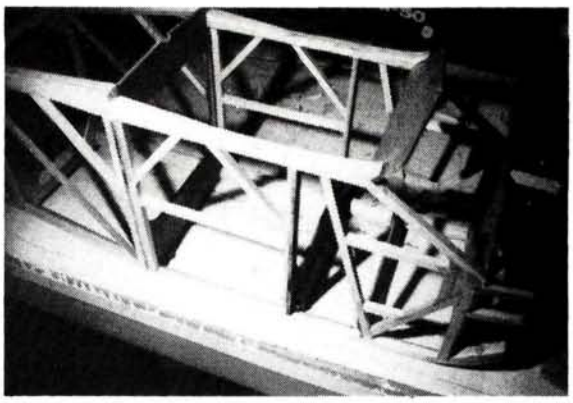
THE BEAVER BUG bit me last year while I was photographing float ships for an article on float fittings. After wandering about in a sea of these ships, there it was: big, kind of ugly, narrow, long-wing, fat and stubby—guilty on all counts. But if you want to pick a seaplane that's one of the most revered for pure hauling ability and solid flying qualities, this is it.

Unionville Hobbies of Canada* kits a 96-inch machine, and Ikon N'West* kits another big one here in the States, but where's the small one? Since the Beaver is so popular in full scale, why no .40-size examples? The primary reason is probably the problem of getting the CG far enough forward without adding weight; next come the difficulties involved in designing a film-covered, open-frame ship that looks like its full-scale tin brother, and in constructing a torsionally stiff high-aspect-ratio wing with slotted flaps.

deHAVILLAND DHC-2 BEAVER

PHOTOS BY ED WESTWOOD

The author's Beaver on static display at the annual Puyallup, Washington, show. Got everyone's attention, was an obvious favorite!



Fuselage sides joined. Structure is sturdy but not heavy.

Assuming these problems can be overcome, you still have to keep the ship light enough to fly well and still look to scale.

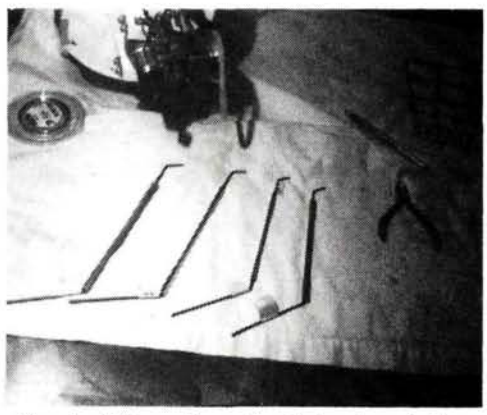
These were the problems that confronted me as I began drawing. Since the external configuration was fixed for me, I just had to put a light, strong, structure inside and a big 4-stroke up front to balance the short nose moment. I knew that if I did need nose weight, putting it in the float tips would minimize the amount needed.

Before I tell you about construction, I'll just touch on my performance goals. This ship is designed to look, fly and sound like its full-scale counterpart. It isn't an acrobatic machine, but with a strong .40 4-stroke, or even a .50 (if you're brave), when it breaks water, you can point it straight up, and only its diminishing size will make you level off.

Of course, for scale-like takeoffs and landings, flaps are mandatory. Dropping the flaps on the turn to final will allow you to point the nose down at a 30-degree angle and spot your landing for maximum scale realism. My side-mounted Saito .50 is admittedly slightly large for this 6.5-pound ship, but I remembered trying to fly off the Pine Hollow reservoir in the hot summer sun with a pooping .40. This year, I was ready, and it was the only place where I really needed full power on takeoff. Back at sea level on cooler days, half throttle is all that's needed. The engine even sounds like the big 450hp Pratt & Whitney chugging by.

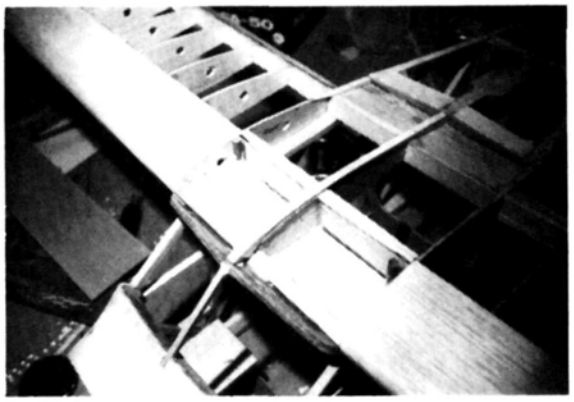
CONSTRUCTION: This is straightforward, but I recommend that you read the text while perusing the plans, and pay special attention to the assembly sequence. You'll notice that the scale float struts exit the fuselage sides above the bottom and must be locked into place after the fuselage has been completed and covered. The struts

A LOT OF AIRPLANES have been referred to over the years as "classics," "workhorses," "sturdy," "pilot's airplanes" and other terms of endearment, and the deHavilland Beaver is no exception. To quote: "The Beaver: Sturdy bush aircraft developed by deHavilland Aircraft of Canada Ltd., puts on military garb and joins up—with the United States. Over 300 of these rugged craft are slated to be flown across the border to our Army and Air Force during the coming months.The L-20 version will be basically the same airplane that deHavilland sells for $26,450 flyaway Toronto." This quotation was taken right out of the June, 1951 issue of *Model Airplane News!!* This old bird of the land is worth two in the bush! ■



3/32 wire fittings. Streamlined aluminum tubing is slipped over wire before lower bend is made.

Robart differential bellcranks are used for aileron control.

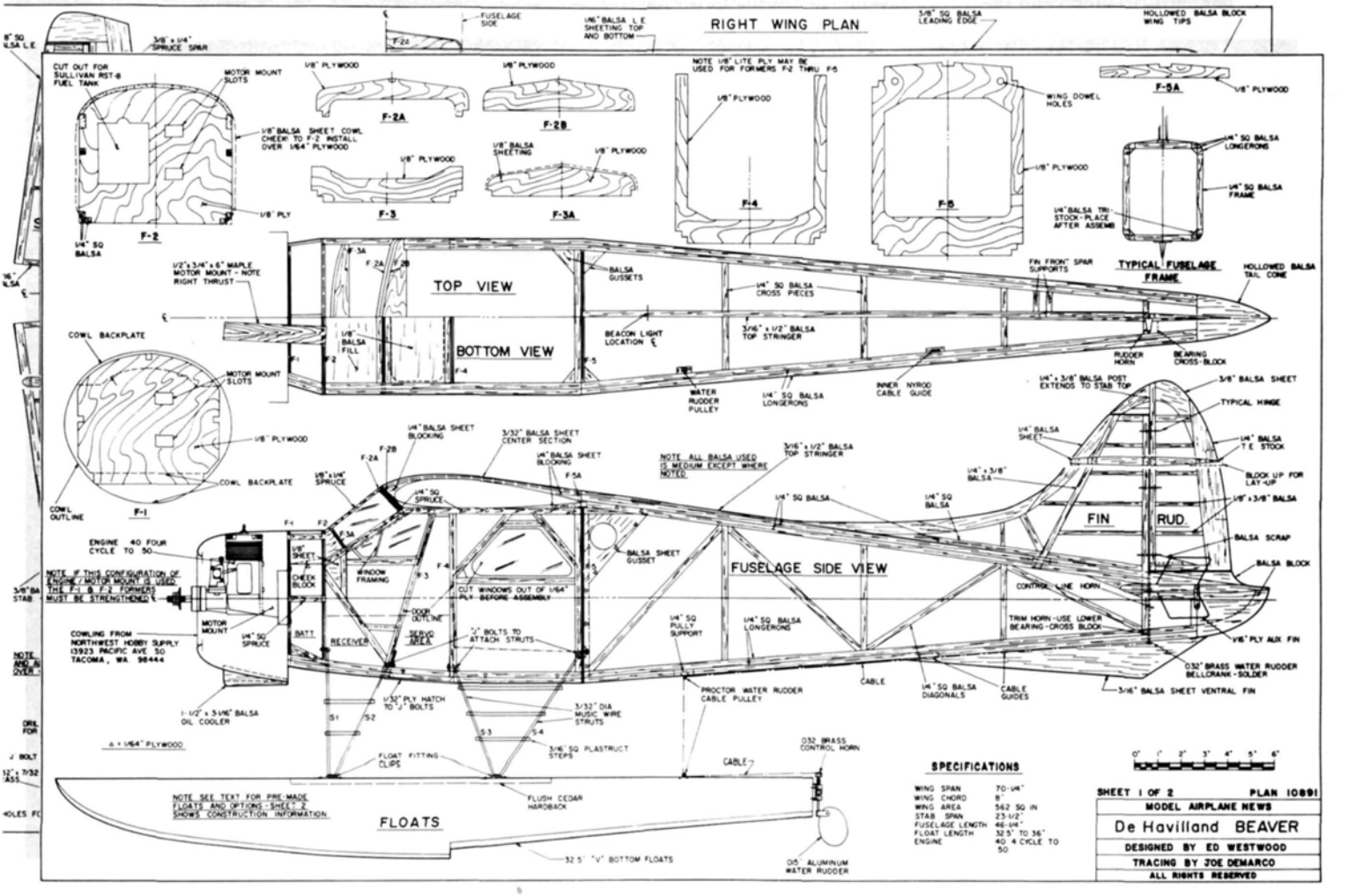


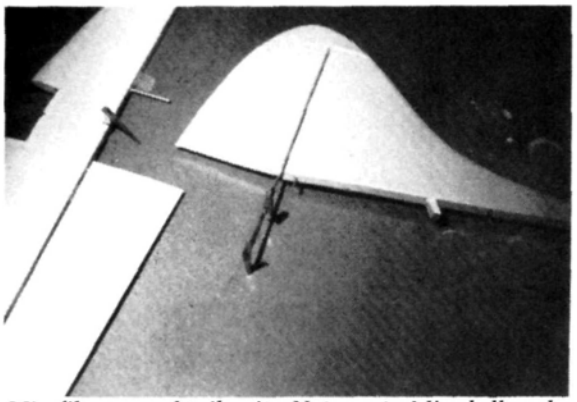
Wing/fuselage joint. Note fiberglass tube hold-down screw bushings.

can be removed and straightened, or replaced fairly easily following a bad dunk. The one-piece wing is keyed and locked to the cabin top, rather than to two panels on each side of the fuselage as in full scale, and this eliminates alignment problems and control connection difficulties. Finally, all surfaces and the floats are vented to eliminate any differential-pressure sucking caused by changes in altitude and temperature.

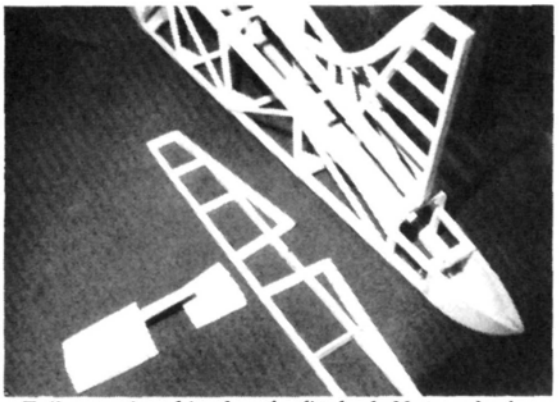
• Fuselage: This classic built-up box structure differs only in assembly sequence. The bulkheads are secured to one side, and the other side is attached to form the forward box. The rear sides are drawn together and the additional inner longerons secured, and then the assembly is glued together in the usual way.

The fuel tank, servos, J-bolts, strut-attachment plates and control rods are installed before the 1/64-inch sides are secured. The chines are then rounded, either by using a balsa plane, or (as I did) a router and a 1/2-inch carbide bit. The junction where the plywood and sides are exposed by the contouring might have to be filled slightly, so be patient as you complete this step.





Micafilm covered tail units. Note control line bellcranks used to keep all pushrods inside fuselage. All adjustments are made at the servos.



Tail cone pinned in place for fit check. Not much of a stab, but it does the job very well.

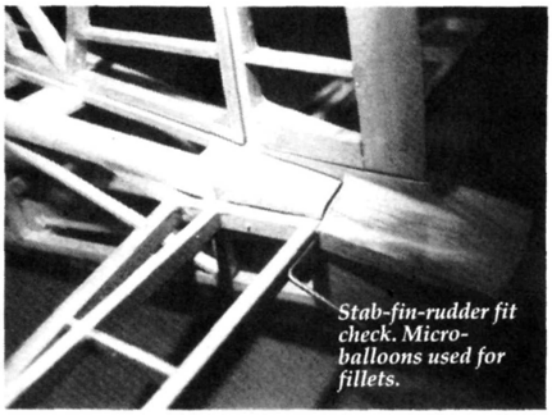
Now the front is sheeted and the lower-windshield extension panel carefully joined to the rounded top between bulkheads 1 and 2. The 1/8-inch cheek panels between these bulkheads are added last and feathered in at the top and bottom. Drill the engine-mount holes, check the engine for fit, and set the fuselage aside.

• Tail Group: Assembly is straightforward, but care must be taken when blocking up the elevator and rudder trailing edges to ensure proper alignment; the upper ventral LE must also be blocked up 1/16 inch to be centered. Hinge slots are made before covering so that those little wooden chips aren't left in the bays.

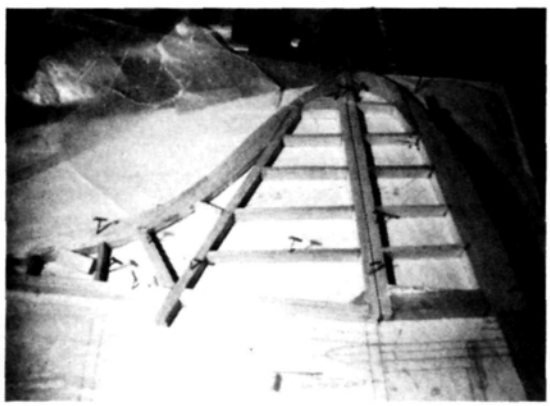
Remember to drill out the inside of the elevator balances and add at least six B-Bs. Hinges can be either the easy type or the standard pinned ones, but whichever you choose, seal them well with silicone after installation. The auxiliary fins are installed before joining the elevator, but after covering. Holes are drilled in the elevator and rudder root blocks to accept the 4-inch control-line elevator horns.

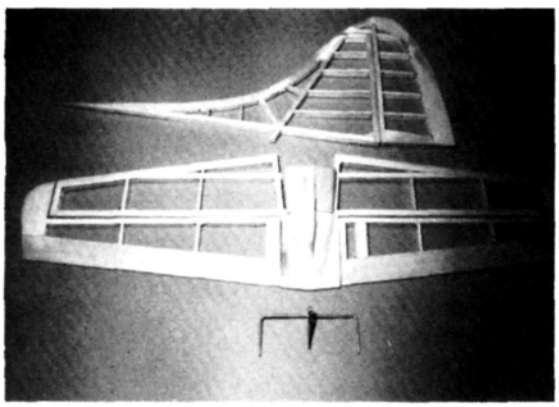
Groove the stabilizer and fin trailing edges before covering to allow a proper recess for these units when they're installed. The rudder/fin assembly is attached to the covered fuselage first. Hinges should be permanently installed in the fin, but not glued in the rudder until the horn has been properly established in the fuselage and accommodation has been made for the lower bearing. Remember to cut off the lower angle of the horn to accept the .032 brass water-rudder bellcrank. (This is soldered into place after the access hole in the bottom of the fuselage has been closed.)

Small 1/32-inch tabs are secured to the ventral fin corresponding to the fuselage cross-braces. The fin is attached with No. 2 sheet-metal screws through the tabs. The tail cone and center elevator fairings are carved from soft balsa. Make the cone slightly wide so that it can be sawn down the center and hollowed, then glued back together. I painted these items: first, with a couple of coats of dope and then with matching Formula-U*. If your color scheme is white, like mine, white tub sealant is the ideal filleting material to close the fin/fuselage, stab/fuselage and tail/cone fuselage joints. Remember to coat the quick-links with light grease before closing the fuselage. To ensure proper tail alignment, be sure to lock the wing into place before securing the vertical and



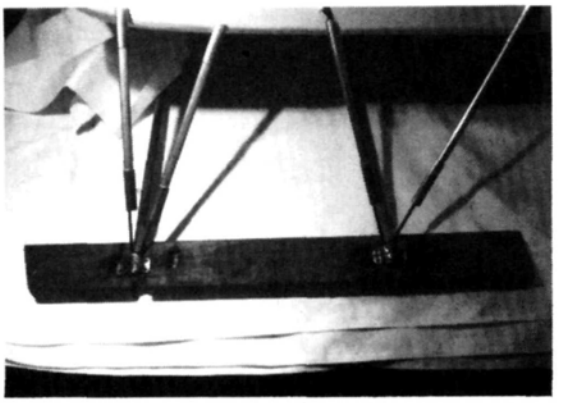
Stab-fin-rudder fit check. Micro-balloons used for fillets.



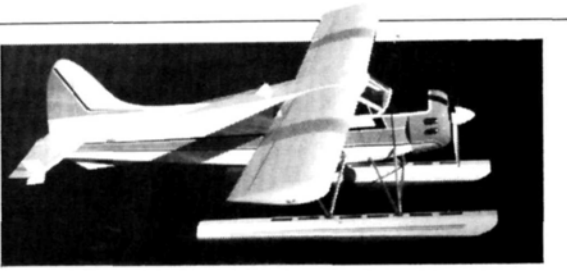


Left: Completed tail group prior to covering.

Far left: Rudder/fin framework in build-up stage.



Soldering the float-mounting clips to the strut assemblies.



#10891 deHavilland Beaver $13.50

This scale rendition of deHavilland's workhorse is ideal for .50-size 4-stroke engines, but 2-strokers will work equally as well. The plans are well detailed and include float construction and installation drawings. Balsa and ply are the primary structural materials, with foam used for the floats. Wingspan is 72 inches. Recommended for the intermediate-level builder. Two large sheets.

horizontal stabilizers.

• Wing: This isn't simple, so take a deep breath and follow me. Start by making the rib templates out of 1/16-inch plywood. Drill two fine holes in these templates so that they can be pinned to the 3/32-inch sheet for cutting. Do the same with the flap and the aileron templates. Note that the templates must be made slightly undersize, since the No. 11 blade will slightly enlarge the cutout. Try a couple of ribs, and check for size before you cut them all.

The spars and upper and lower aileron and flap panels are now cut. Don't forget to mark each one somewhere so that they won't be mixed up in final assembly. Before assembling the ailerons and flaps, dope both sides of the sheet to minimize shrinking and warping during final painting. As with the tail group, cut the aileron hinge slots before securing the top sheet. A word to the wise here: CA is very difficult to sand; I usually use Sig-Ment* for any joints I'll have to sand; it takes longer to dry initially, but the results more than offset the time spent on it. Before sheeting the leading edge, the 1/8-inch-wide carbon strips are glued to the upper and lower surfaces of the spar using CA.

Sheeting is tricky. Mark the underside of each sheet for the rib and spar locations. Now put a thin line of Titebond over the lines and onto the corresponding wing members. Let it dry. Spray the other side of the sheet so that it will naturally curve slightly, and iron the sheet to the wing with your sealing iron on a high-temp setting. To ensure that you don't build any warps into the structure, be sure to block the wing securely first. My ship has no washout and flies well without it, but if you err, err on the side of washout.

Now make a leading-edge template and contour the leading edge. The wing tips are made of solid, but hollowed-out, soft-balsa blocks. Mark the outline from the wing, and then cut and sand it to the exact contour. Attach the tips, and give them a couple of coats of dope, lightly sanding between coats. The two wing panels are joined in a jig, which is made by attaching four female rib patterns to a 6-foot 2x6. If you don't do this, you won't be able to align them properly, so take the time to make the jig. While in the jig, the root doublers are fitted and glued into place. Don't attach the top sheet yet.

Now take the wing out of the jig, finish any of the bottom work in the root, and put it on the fuselage. Measure from tips to tail until you're satisfied that it's aligned, and temporarily fix it in place. The fiberglass stub hold-down screw tubes are installed, and the center is sheeted. Of course, some trimming will be necessary to ensure that the top of the wing center section matches the fuselage; that's why you don't finish this area in the jig. The rear wing alignment dowels are slipped into the holes in the bulkhead and tack-glued to the underside of the root trailing edge. Drill through the upper fuselage saddle sides and into the pre-placed hardwood blocks. Tap the blocks for 10/32 nylon screws while the wing is still in place. Now the wing can be removed and the rear alignment pegs epoxied permanently.

The wing is now turned over and the bellcranks and pushrods installed. The .032 brass strut plates are installed next; be careful to ensure that the angle is correct, of course. These are active struts, so take the time to ensure that they're anchored well. Temporarily attach the ailerons and line up the 60-degree differential bellcrank pushrods to the horns. Mark the ailerons for the horns, remove them again, and secure the horns. At this point, I'm assuming that you've already applied the final paint to the ailerons, but if you put the horns on first, you can always take them off for painting. The wing-top trailing edge just ahead of the flaps has a piece of 1/64-inch ply secured with 1/4-inch triangle stock just below for support. This is the slot director, and I fiberglassed the underside with 3/4-ounce cloth to ensure that the covering wouldn't cause it to bend upward when tightly shrunk.

• Struts and float fittings: 1. Wing Struts: Although my struts were exactly 13.4 inches long from pin to pin, it's always

(Continued on page 82)

Basics of Radio

by RANDY RANDOLPH

Because the airplane has been properly balanced, it will be fun to fly and easy to control.

"BALANCE: STATE OF EQUIPOISE, as between weights, different elements, or opposing forces; equilibrium; steadiness; as, to disturb one's emotional balance..."

Mr. Webster's definition could well serve as the ideal when trying to achieve the perfect balance of a model airplane. There's even a stinger on the end of Webster's description: an illustration that shows a modeler's situation when his airplane *isn't* in balance!

Design engineers use the term "center of gravity" (CG) to describe the point at which all the weight of an airplane is in complete balance. This point is a little difficult to locate, but the extension of a line through that point on the airplane's horizontal and lateral axes is of great importance, and easy to find! That little circle on our plans with the letters "CG" in it tells us where we should balance our airplane when the wings and fuselage are level.

Each airfoiled wing has a certain angle of attack at which it has the most lift with the least amount of drag. To make this work in our favor, the wing is mounted on the fuselage at an angle that will allow it to operate at its best angle, and the fuselage offers the least amount of drag while the wing is at this optimum angle. The horizontal tail is set at the proper angle of attack to allow the wing to maintain this angle while in flight. Then the aircraft is balanced so that these parameters can be maintained while the airplane is in stable, level flight. This produces the most efficient use of power to overcome drag during flight.

A word in the last paragraph that's of major importance is *"stable."* Stability allows an airplane to fly for extended periods. A very unstable airplane will fly, but its time in the air is usually very short and its landing catastrophic! Stability is achieved with the proper size and design of the flight surfaces, the wing and the tail, and with the proper location of CG.

A nose-heavy airplane is more stable than one that is tail-heavy, and, as more weight is added to the nose, it becomes so stable that it's uncontrollable and won't fly. Conversely, the more tail-heavy an airplane becomes, the more unstable it becomes, until it reaches a point where it's uncontrollable and won't fly. The result is the same whether an airplane is balanced too far forward or too far aft, but "uncontrollability" is reached much sooner as the balance point is shifted toward the tail.

Some types of free-flying, indoor, rubber-powered models are balanced as far aft as the trailing edge of the wing, and in some cases, even farther back! This is

Control

done because the airplane is expected to fly in a controlled airspace with very limited attitude changes. They're "set" in the air by the modeler, and they climb at a gentle rate in a fixed circle. If the flight path is upset beyond a certain limit, they become unstable and the flight ends. This situation is fine for a very light indoor model that suffers no damage from occasional crashes, but it's out of the question for R/C airplanes!

The proper balance point for most of the model-type airfoils in conventional aircraft is located between 25 and 30 percent of the distance aft of the leading edge of the average cord. This is usually, but not always, the location of the main spar and the thickest part of the wing. With its balance established within this range, an airplane is stable and controllable.

An airplane with very rapid response to small elevator and rudder-control movements is tail-heavy and almost impossible to land. An airplane that can't be stalled with full-elevator control is nose-heavy and difficult to land. An airplane in proper balance is a thing of beauty—it's graceful in flight and a pleasure to fly because of its smooth response to control inputs.

Any new model should be balanced as called for in the plans. Since no two airplanes ever come out the same, after the test flights, try making slight alterations in the balance to achieve just the right point for that particular plane. If the plane seems nose-heavy, try adding small amounts of clay to the tail; if tail-heavy, weighted prop washers, made especially for this purpose, can be added to the nose. Somewhere, there's a point that's just right for every model.

There's one more balancing job to be done, and that's lateral balancing. Balance the airplane down the center line of the fuselage by adding weight to the light wing tip (or lightening the heavy one). A balanced plane not only flies well, but it will also help *you* maintain *your* "balance"—of the emotional variety! ■

Sporty Scale Tec

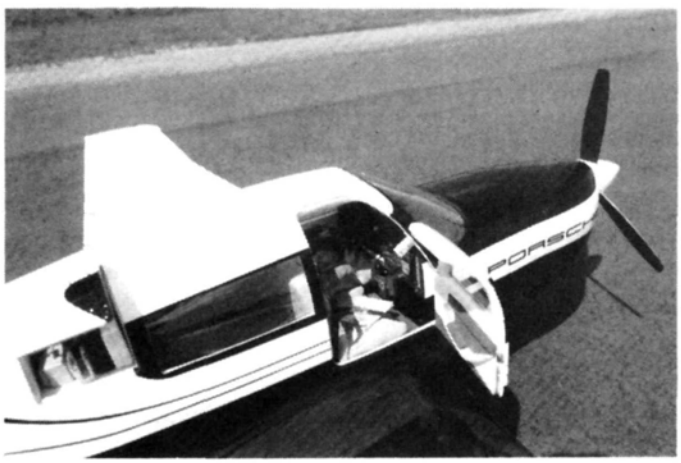
by FRANK TIANO

SCALE MODELING on any level—professional, competitive, sport, or personal—requires a lot more attention to detail than most other aspects of our sport; yet we so often see airplanes with highly detailed upper surfaces and bland undersides, great color schemes but no panel lines, or super-clear canopies or windows that display scruffy pilots or shoddy interiors. When you come across such an example, I'm sure you say to yourself, as I do: *Why?*

Granted, a subject with a very tiny cockpit access area or a small canopy is very difficult, at best, to detail, and if you asked, "Who cares?" you'd probably have a point! Take a larger model, however, say something in 1/6 scale or larger (or even a smaller one with a lot of greenhouse area), and you're almost obliged, as a true scale modeler, to put something—almost anything—inside all that glass, and it ought to look believable. A nicely executed T-28, Stuka or T-6 just ain't taking advantage of all those "ooohs" and "aaahs" out there if you have a slab cockpit floor and no pilot. I realize that not all of us are cut out to be a Van Gogh, but it really doesn't take much effort to make a good-looking interior or pilot. A simple "cockpit box" detailed outside the model and added later as a separate unit is the way many of us go. There's a wide variety of pilots out there, too; just pick one that's close to the proper scale.

Ed Mitchell's (N. Tonawanda, NY) Boeing P-26 from blown-up Cleveland Plans: Conley 120, 70 inches.

Even if you're a dyed-in-the-wool competitor, a real stickler for authenticity, but you can't find scale cockpit detail, you can fake it! That's what everybody else does! That's right! I know it's hard to swallow, but many of the sport's most well-known artists make an interior that does the job, period. What else can you do when there's no data available? And since cockpit interiors aren't judged in AMA competition anyway, who cares? The important thing is that the airplane looks more complete and a lot more professional with an interior and a nicely painted pilot. Even a Spartan interior is preferable to nothing at all.



Wayne Siewert's (Minneapolis, MN) scratch-built Porsche/Mooney: complete scale interior and baggage compartments.

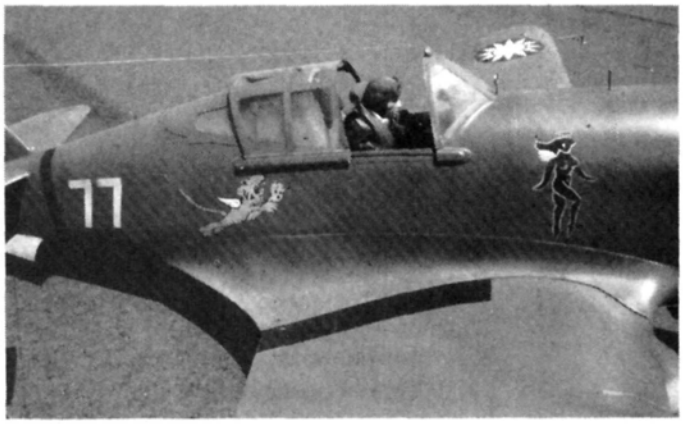
The same thing goes for the bottom of the airplane. Lots of modelers don't put as much effort into finishing the bottom as finishing the top, because they figure nobody will see it anyway. Well, what do you do when an absolute bottom freak like Stunning comes along and says, "Well, flip it over and let's see what the other side looks like." Your embarrassment will probably only be exceeded by the square root of the number of friends hanging around when Colonel Steve spits out that challenge. So take the extra time and put a few doo-dads, some panel lines, rivets, markings, or whatever, on the bottom, too. It really *does* make a difference!

Along the same theme—detailing, that is—I'd like to share with you a new product that I've just tested and used and like a lot. Most of you have heard of Jeff Foley, who's an outstanding scale modeler from Raleigh, NC, and has been at nearly every Nats, Masters and, most recently, Top Gun with a very competitive Platt ME-109 or Zero. Well, Jeff got tired of trying to find that printers' litho plate that everyone's always talking about for making hatches and for simulating aluminum covering, so he did some R&D and is now producing his own. For about a pound, a nickel, a handful, a fin, a fiver, half a sawbuck, or a five-dollar bill, you

can purchase four sheets of this .002 pressure-sensitive aluminum foil that's so thin it will form around most compound curves. It take all types of paint, trims easily with scissors or a knife, and it's very user-friendly. Each sheet measures 10x13.5 inches and is available from Jeff's company, Model Engineering*.

By the way, I recently found out why everybody's having such a hard time finding that printers' plate. It seems that some TWA airline pilot has been visiting every source in each city he stops in and scoffing the stuff up! Word is that it's none other than Charlie Chambers, and he's saving all the stuff for his 1/10-scale Convair B-58 Hustler, which just hit the drawing boards!

Even though I've said many times that you're more than welcome to write and voice your opinions or requests, I must be honest and tell you that the letters I receive discuss color chips or paint at a nine-to-one ratio! So along those lines, let me slip you a little more info about colors. It's no secret that most of the scale fliers who compete chose epoxy paints for their finishes. Usually used with a flat, satin-type hardener, these paints are extremely durable, take to weathering techniques very well and are fairly easy to mix to match a particular chip. *Real* epoxy paints are composed of two parts and the finish does *not* dry: It *cures*. Once cured, it's impervious to almost everything except a direct hit from your wife's butcher knife.



Tom Czikk's (N. Merrick, NY) P-40 from Art Johnson Plans: Super Tigre 3000, 20 pounds, full cockpit, authentic A.V.G. garbed pilot.

Frankie T's P-39: 19 pounds, O.S. 108, full interior and painted Platt 1/5-scale pilot.

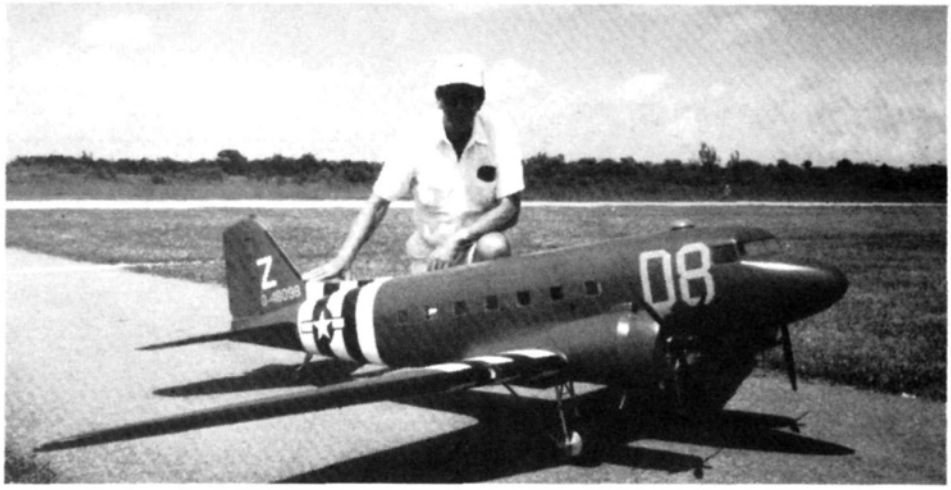
We also know that there are two major sources of epoxy paints in our industry, and I use both of them. Hobby Poxy*, however, has gone way out of its way to match many, many, many *FS color chips* for the modeler. Hobby Poxy then burned some more midday oil and printed the formulas for matching these colors and now offer them to us—*free*.

Now, I want to tell you that I was very hesitant about using the "F" word in print, because many of you won't read any further. But please, this time, keep reading! If you send Hobby Poxy a large, stamped, self-addressed envelope with 25 cents postage on it, along with a note that says, "I would like the complete set of formulas to match the Federal Color Chips that Frank Tiano referred to in his *Model Airplane News* column, and a color chart as well," they will send them to you right away. I'm not going to repeat this offer again, so I strongly suggest that you send for the formulas now, or at least cut out this portion of the column and paste it on the windshield of your car or your bathroom mirror! In return, you can expect formulas for the following: U.S. Air Force, WW II; U.S. Navy, WW II; U.S. interior colors; USAF "European One" colors; U.S. Trainer colors; U.S. Insignia colors; USAF (Vietnam to present); Japanese Army and Navy WW II; Israeli Air Force; Royal Air Force, WW II; RAF Insignia colors; and Luftwaffe colors, WW II. Best of all, the documents you'll receive also call out the FS number right next to the formula. So, looking back, *MAN* has given you the source of the FS numbers, printed the cross-referrals for the numbers and now shown you how to get free formulas for mixing those colors from commercially available paints. Who loves ya?

Last, but certainly not least, I'm succumbing to many requests for help from those of you who strongly feel that you have received some bad, damaged, terrible or misrepresented merchandise from a manufacturer who advertises in one of the hobby publications. First, I assure you that most manufacturers are honorable: Most realize that treating you unfairly

SPORTY SCALE

(Continued from page 29)



Mario Yederlinic's (Boca Raton, FL) Ziroli C-47: 39 pounds, O.S. 108s, Robart retracts.

won't help their business. With this in mind, I'll assume that we're talking about the few "fly-by-night" outfits that spring up from time to time. Second, some of this advice won't help those of you who have already received and paid for merchandise in the past.

When you order a new kit, or some support gear such as retracts, spinners, or wheel struts from a source that's new to you, there are many steps you can take to help ensure your satisfaction—or at least minimize your losses if you're dissatisfied. When you first order the new items, always try to pay with a well-known credit card. If the shipment comes COD, pay with a check. Next—and most important—always open and inspect your package the day you receive it. *Do not* procrastinate and save this inspection for a later date. Let's run through a hypothetical case:

You've been looking at that new WW II fighter kit for a long time. Boy, the pictures look neat, and best of all, this new company is offering the cockpit kit, spinner and retracts, to boot! You order one and put it on your Visa or MasterCard, knowing full well that there are a few facts associated with this purchase that you cannot deny: It will probably take you a couple of months to pay the thing off; if your spouse gets wind of how much these toys really cost, you'll probably be paying twice, because divorce ain't cheap, either!

Anyhow, on receiving the box, you do as I've told you and open it that evening; and what, to your wondering eyes, shows up, but a fuselage with seams so far off that 4 pounds of filler can't make it right; foam cores that certainly feature washout in one panel, but, strangely, none in the other; balsa wood that's best suited to being a flotation medium in some luxury yacht; a set of retracts forged by Freddy Flintstone himself, and an array of parts not fit for an airplane you once saw in your worst nightmare. All together now: *Ouch!*

Follow the next steps carefully: Draft a letter to the manufacturer right away, stating the nature of your complaint. Address it to the owner or a customer-service department. If at all possible, on the same day, call the manufacturer and discuss your problem with someone there. The next step may seem harsh, but with some companies, it's the only thing that works. Advise the person on the phone that you're sending the merchandise back and that you're either putting a stop-payment on your check, or you're notifying the credit card company that you have a serious dispute on your hands, and document *everything*. Granted, you'll be out the price of the return postage, but it's still better than getting beaten. Best of all, you've done no wrong! You've returned the faulty items to their former owner and can go on about your business. I know that we're smart enough to realize that with most companies, a simple phone call is enough to rectify the situation; furthermore, most companies that have been around a long time didn't get there by deceiving people like you and me! Maybe, someday, we'll be able to offer you a list of products that we know for certain are just junk. Wouldn't that be wonderful?

Well, that's it for this month. Next month, I'll look at some large plans, offer

(Continued on page 106)

Clockwise from top: Bart Van Syoc brought this twin Enya 46-powered Great Planes Aero Commander. Conversion to seaplane by Steve Milos of the Portland Skynights.

Bob Reggio's Nosen Aeronca Champ is framed against the Clearlake sky. Powered by a Fox 78, it weighs 13½ pounds with Sullivan floats, and it flies on rudder and elevator only.

Fred Reese's new kit offering, the Ryan STA Special on Golden Age Models Custom EDO floats. This 17-pound, O.S. 120-powered beauty is a thrill to watch and a joy to fly.

Immaculate Ziroli Taube by James Vice with O.S. 1.20 4-stroke and Futaba radio—one of the best scale efforts at Clearlake meet.

David Seiler's scratch-built 1/5-scale Beechcraft Staggerwing taxis out to the flight line. Model is scaled after a full-scale version that David owned. With O.S. 120 power and a Century 7 radio, it weighs 18 pounds, 10 ounces.

PHOTOS BY JOHN SULLIVAN

The float-fly classic gets a time capsule

'89 CLEARLAKE

by JOHN SULLIVAN

FIRST, A LITTLE recent history: In September '88, Morris Curry, a member of the Clearlake Modelers, took a copy of last year's *Model Airplane News Float Special* to a Lakeport City Council meeting intending to read the highlights of our '88 report and to thank the council for supporting our hobby. Morris left that meeting with much more than he ever expected.

It turned out that the Lakeport Council appreciated the Clearlake meet as much as the organizers welcomed the city's sponsorship...and more! The council lauded the Clearlake Modelers' efforts and commended them for consistently running a superlative event. Then, to show *their* appreciation, they voted over $100,000 for expansion of the park flying site, RV campground and ramps, with the stipulation that modelers would *never* be charged for using the site. The icing on the cake came when the council ordered that a time capsule containing the *Model Airplane News '88 Float Issue* be installed on the site "to remind the citizens of Lakeport 50 years from now of the enjoyment this meet has brought to participants and spectators."

This year, on entering the park, the first thing you see is a brand-new, beautifully ornate, Victorian bandstand in the shade of the park's huge 100-year-old firs. In the center of the bandstand's floor, you'll see the outline of a cold joint, and just beneath that cap lies the time capsule containing our magazine. You almost have to pry this information out of the Clearlake Modelers. As a group, they have an astounding sense of humility and, as such, they make perfect hosts for what has become the longest-running annual float meet in the U.S.

So what was this year's meet like? It was a blast! Three days of the most fun you could ever hope to have. Once again, we were blessed with great weather: lots of sun and gentle breezes. The latter are very important to a float meet. It's one thing to hold a meet with 15mph winds on land, but quite another when that same wind is whipping up scale, 8-foot waves! The turnout of 117 registered pilots was slightly less than last year owing, I think, to the fact that the meet was held over Mothers' Day weekend.

Clearlake is a fun fly and, as such, there are no awards like technical achievement, but if there were, Doug Wilson would have walked away with the T/A Trophy in a New York second! Doug brought an 11x7 1/2-foot 8-engine Spruce Goose that had absolutely everyone at the shore's edge every time he flew. The 30-pound foam, balsa and glass Goose in 1/29 scale was powered with O.S.25 ABCs set up for asymmetrical power. The finish, engineering and workmanship on the Goose was flawless, and the astounding thing, to me, was that Doug built the plane from scratch using a 7-inch three-view published in *MAN* a few years ago! Doug flew the plane single-handed using a Futaba 7-channel radio for guidance, and every landing was met with thunderous applause. Awesome!

There were no less than eight float-related

Above: One-half of the Clearlake Meet flightline. The full-scale Cub in background was available for rides over the weekend. This is probably one of the best floatplane sites in the States!

'89 CLEARLAKE

Doug Wilson's 11-foot, eight-engined Spruce Goose taxis out for second flight. See text for specs.

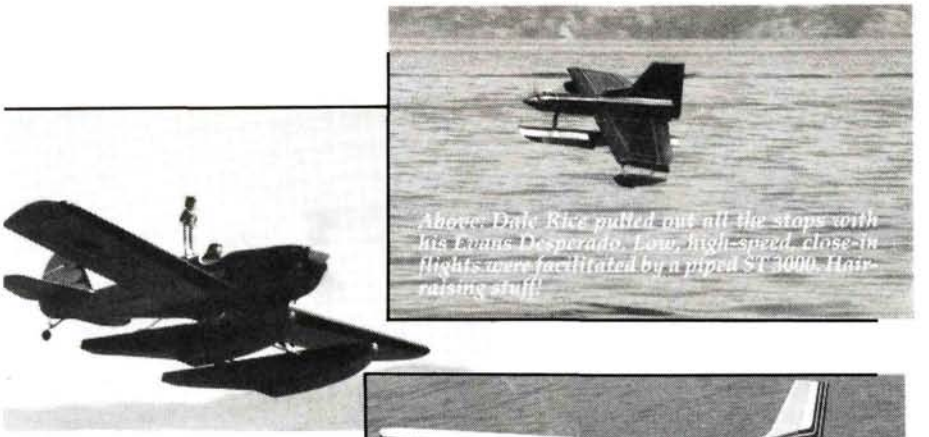
Above: Three-man pit crew launches Doug Wilson's Spruce Goose. Model features asymmetrical power setup. This complex model is very reliable and its performance is excellent.

Bruce Estes' 1/4-scale Balsa USA Clipped-Wing Cub and floats. With its Zenoah G38 power and smoke system, it weighs 18 1/2 pounds.

Charles Richard's scratch-built 1/3-scale Super Cub PA18 on flyby. Incredibly realistic model.

manufacturers and designers present. Fred Reese showed up with his brand-new 90-inch Ryan STA Special on his own scale EDO Floats. What a gorgeous plane and a remarkable flier! The Ryan will join Fred's fleet at Golden Age Models, so watch for the ads. Bill Price had his new Grumman Albatross at the meet, along with his PBY, and he flew the twin .40 amphibians every chance he got. It was quite a workout, and by Sunday afternoon, Bill had several fingers bandaged. Bill has since healed and is busy working on a new release: a twin .40 Canadair. Paul Weston and Ed Westwood drove all the way down from Spanaway, WA, with kits of Paul's fantastic Sea Era and Ed's prototype .40 4-stroke Beaver (see construction article and reviews in this issue).

Paul and Ed's table was surrounded all weekend with guys asking ques-



Above: Dale Rice pulled out all the stops with his Evans Desperado. Low, high-speed, close-in flights were facilitated by a piped ST 3000. Hair-raising stuff!

Above: Chuck Fuller's Quadra 40-powered Sig Skywalker zooms by with Tanya Testarossa hanging on for dear life. Skywalker wing shortened by one bay and features leading edge slats.

Paul Parisi's Pica Cessna 182 taxis back. The 87-inch craft featured a Webra Sped 91, Airtronics radio, Sullivan floats, and a World-Tex, MonoKote and paint finish.

tions and getting answers. This is a very knowledgeable pair! Bill Evans was there with a group headed by Dale Rice, who flew the devil out of a fleet of Bill's flying wings. Talk about abrupt maneuvers! Bill Evans really has this Flying Wing thing nailed down, and if any of you out there are looking for smooth-flying, snaky, aerobatic-types, check out his kits.

Then there was Sullivan, with a van full of floats, videos, epoxy and adhesives. He appreciated and enjoyed meeting many of "Floating Around's" readers. And finally, two of the old guard of the float world: Ken Willard, the daddy of the Seamaster and at least a dozen other floatplane and amphibian designs, and Ken "Big is Beautiful" Runnestrand, who has one of the best sets of plans for built-up giant-scale EDOs around.

The quality of the planes and fliers was up again this year. Gear and rudder designs were much more refined. Many of the float modelers are abandoning the practice of adapting land-based gear to floats, and they're scratch-building gear to suit their seaplanes. Also, many of the planes in attendance are strictly for float operation. I love It!

The Clearlake Modelers have also fine-tuned the mechanics of the meet. Their frequency-control system ran flawlessly and featured a pin system that allowed pilots to see their place in line. It was super and saved the impound-booth operators a lot of grief. Other changes included grouping 1/4-scale planes and smaller ones together in the pits for a nice "one big family" feeling and the installation of carpeted ramps to the water at each of the flying stations.

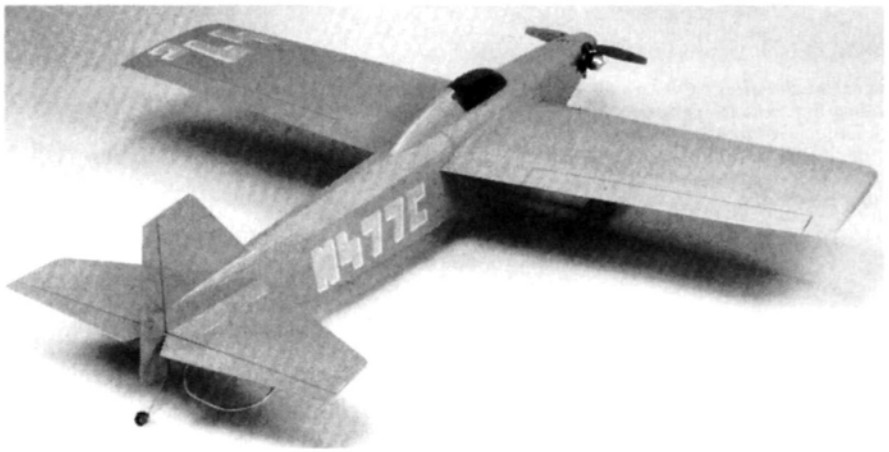
There must be a dozen restaurants within two blocks of the Clearlake site. In addition, the local Lions put on a belt-stretching breakfast that was heralded on all three mornings by Wally Rinker's now-famous, amplified Tarzan imitation, which can reputedly be heard 35 miles away.

One more recollection: At about 10 p.m. on Saturday, I took a walk through the park for some fresh air, and I found Art Young, Wally Rinker, Bill Gresham and Bill Knight waiting for the night watchman to show up and guard the impounded equipment. We talked for a long time about the effort it takes to put on a meet of this size. Out in the harbor, tied up for the night, were eight boats: everything from retrieval rowboats to I/O patrol boats, to a pontoon boat for first flights for unproven floatplanes. I remarked that during the day, with all the mayhem, you're not even aware of this fleet, but at night, you're looking at over 100 feet of boats just for managing the meet from the flight line out!

Each year, over 50 dedicated people start working on this meet in December, five months before the rest of us drive up to play until we drop. I know they don't do it for the money, because they practically give away everything they get, and I know they all have other things they could be paying more attention to, but they endeavor to make every year better than the last. Thanks, guys, from all of us. See you next year. ■

Small Steps

by JOE WAGNER



Scott Christensen's G-String snap-rolls better than any other R/C model he's flown. With Cox Tee Dee .051 power, it weighs 19 ounces. Span is 29 inches.

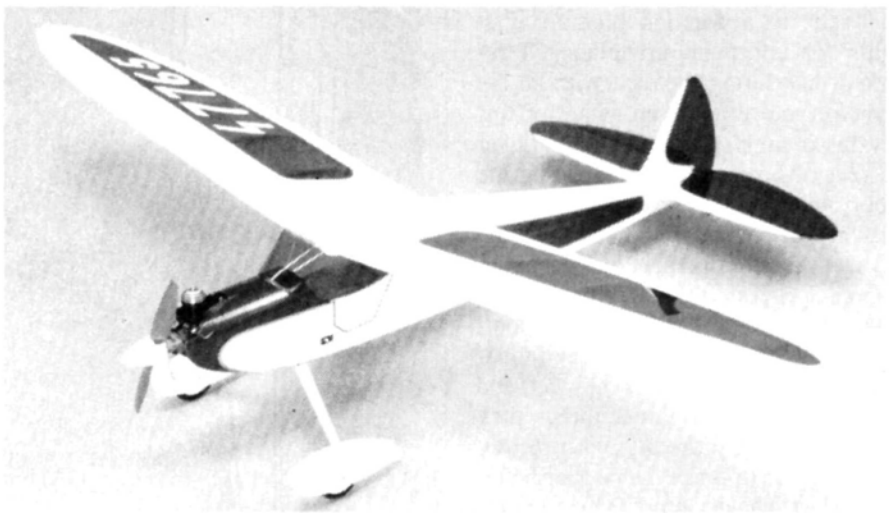
HERE AT THE EASTERN headquarters of the gigantic Small Steps organization, the mail keeps coming in! There are *lots* of folks building and flying small-sized R/C airplanes these days. Young and old; novice and expert; they're all enjoying the creativity and sheer fun in our favorite branch of aeromodeling.

Top Flite Models'* Scott Christensen wrote a long, highly informative letter describing his endeavors with small R/C models since the mid '50s. Before moving to Chicago as a Top Flite executive, Scott was an engineer at Cox Hobbies* for quite a while. He's really sold on Cox engines for powering his R/C airplanes. As Scott puts it, "Most of the Cox engines are usable for a wide variety of models because of their terrific power output."

Scott also sent several beautiful photos (taken by Harry Higley) of some of his original-design airplanes. Two are shown here; I'll use the others in a later column.

Scott says, "When I sit down to design a small R/C model, I try, to the best of my ability, to eliminate as many compromises as possible. In the past, I think a lot of designers compromised the 'look' of their models in favor of 'flyability.' I don't believe that this has to be the case anymore. Today's equipment and building materials really allow you to go to whatever lengths you're capable of to produce designs that not only fly great, but 'stop the show' when they're in the pit area.

"When a well-built, nicely finished small R/C airplane is brought to a flying field, everyone, regardless of personal R/C interest, will invariably make their way over to ask questions about it. There's just something about a miniature R/C model that seems to strike a nerve in all modelers! And when that same model flies—and flies well—it's almost customary to hear the sound of clapping when you walk out to pick up the airplane."

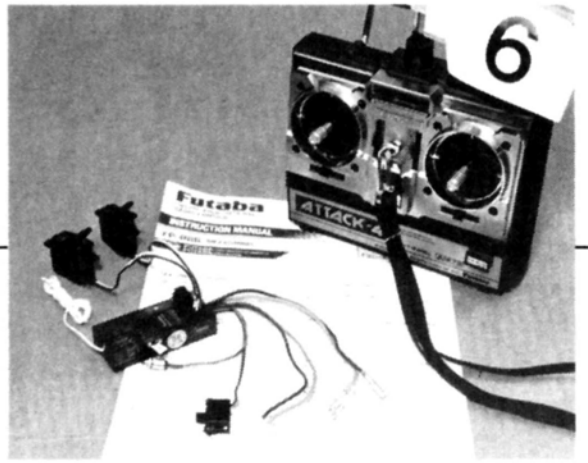


Scott's Rascal is his updated R/C version of the '50s Top Flite FF kit. It's a 2-channel model with TD .020 power and 112 square inches of wing to carry its 9 ounces of weight. A great flier!

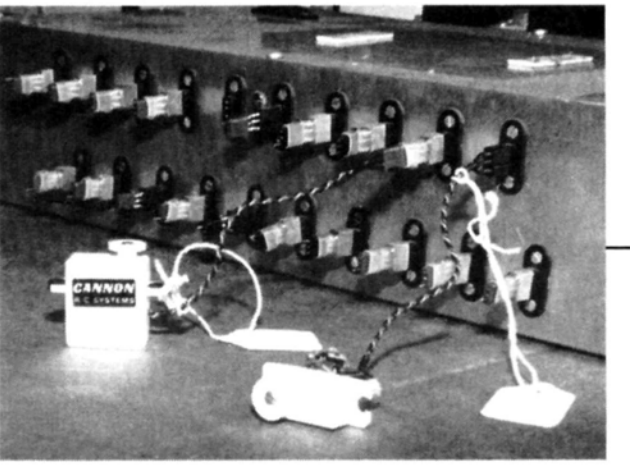
A few months ago, I visited Cannon R/C Systems'* new facilities in Simi Valley, CA. As usual, Bill Cannon amazed me with the meticulous, microscopic-sized equipment he designs and produces. Never satisfied with the status quo, Bill is forever making improvements and designing new items. Much of what he showed me is still experimental, and Bill asked me not to say anything specific about it yet. He doesn't want to get a flock of orders for items that he hasn't yet perfected for production. All I can say right now is that I was highly impressed by the new stuff Bill's working on, and I plan to buy it as soon as it's on the market!

One item I *can* mention is the new coreless-motor CE-9C Cannon Super-Micro servo. Weighing a mere $^4/_{10}$ ounce, and so tiny you can almost cover one up with a quarter, this servo is even faster and more powerful than the previous CE-9. While I was there, Bill was endurance-testing two CE-9Cs. They'd been cycling continuously for well over a week, and after performing more than *600,000* cycles, they were still functioning flawlessly!

More and more miniaturized R/C equipment is becoming available, as manufacturers recognize the growing



Futaba's new Attack 4 R/C system for electric power. All the "electrickery" is in the receiver, as the multitude of wires from it shows. Motor speed control is built in!



Two coreless-motor Cannon Super-Micro servos in endurance testing. Both had over half a million cycles when this photo was taken—and were still working flawlessly.

popularity of small R/C airplanes. Scott Christensen highly praises Airtronics* mini-R/C systems, and especially likes its tiny No. 501 servos. Scott uses them in all his small R/C models, and says they're powerful enough for almost *any* usage.

I'm just getting my feet wet in electric-powered R/C. (I mean that *figuratively!*) Futaba's* new Attack 4 radio-control system interested me—the version with the MCR-4A receiver. Its innovative built-in motor speed controller saves a lot of time and trouble in wiring the airborne system. In fact, if you have the proper connectors on your motor and Ni-Cd pack, no wiring is needed at all! Everything plugs together; a useful feature if you want to fly the same R/C system in more than one airplane.

The total weight of the Futaba MCR-4A airborne package is 3.2 ounces; that's for the receiver, all its wiring (including a motor-start switch, which I consider to be an important safety item), and two servos. No battery pack is needed: The MCR-4A obtains its current from the electric-motor power supply, which can be 5, 6, or 7 cells. If its voltage drops below about 5.5 volts in flight, the receiver automatically cuts off the motor while there's still adequate voltage to control the model down to a safe landing.

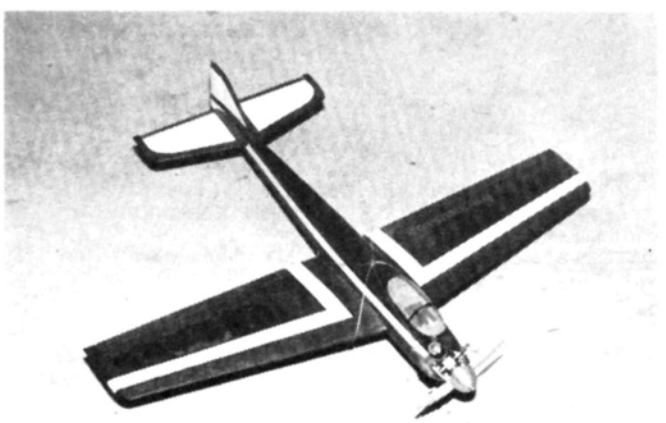
The flying machine that I've developed for Futaba's Attack 4 system is a 270-square-inch monoplane of the "early bird" type: a 1912 Rex Gordon Bennett Racer. Construction will be all sheet balsa (my specialty!). Peck Polymers'* Silver Streak motor will be about right for this model, as it has about a 3-foot span and is powered by a 5-cell 800mAh Ni-Cd pack that will give 9 minutes of power-on time, which seems ample. The Rex's ready-to-fly weight ought to be under a pound: mighty light indeed for electric power!

The new Futaba MCR-4A is a 4-channel receiver; but only two servos come with the system. However, since my Rex Racer won't have ailerons (nor did the original aircraft), I won't need another servo for it. I'll fly with just rudder, elevators and motor speed control, which should be all I'll need for this airplane.

Although I'm not experienced enough in electric-powered R/C to be able to say much about it, I do know that they're clean, quiet and that starting problems are eliminated. I can see another distinct advantage in electric R/C: It makes a lot of my favorite scale aircraft as practical as small R/C projects!

Electric power is heavy—no question about that—but this weight enables building properly balanced, short-nosed airplanes without a lot of finagling to get the CG right. Sopwith Camels, Grumman Wildcats, Nieuport 17s, Supermarine Spitfires, Stinson Reliants—all become practicable R/C projects in small scale with electric power and new R/C systems, such as Futaba's Attack 4.

**Here are the addresses of the companies mentioned in this article:*
Top Flite Models, Inc., *2635 S. Wabash Ave., Chicago, IL 60616.*
Cox Hobbies Inc., *1525 East Warner Ave., Santa Ana, CA 92705.*
Cannon R/C Systems, *2828 Cochran St., Suite 281, Simi Valley, CA 93065.*
Airtronics, Inc., *11 Autry, Irvine, CA 92718.*
Futaba Corporation of America, *4 Studebaker, Irvine, CA 92718.*
Peck Polymers, *P. O. Box 2498, La Mesa, CA 92044.* ■



Full house on .03 power! Bill Cannon's tiny "Red Bee" spans 24 inches and weighs 10 ounces. It's a hot performer; fast and extremely maneuverable.

Bill Cannon with a few of his original design R/C airplanes. The Little Streaker Bill's holding spans 34 inches. It has G-Mark .06 power and 4-channel control.

PREVIEW

Why was the re-enactment created, and what's it all about?

The beautiful Curtiss R3C-2 was built by Larry Tate, John Hanks, Jerry Leciej and Bob Martin—all members of the Desert Hawks R/C Club of Lake Havasu, home of the upcoming event. The model, of all-wood construction, weighs 39 pounds and is powered by a Sachs 3.7. We've included the shot of lovely Robin Krahenbuhl to provide some indication of the size of the Curtiss...yeah, sure!!

PHOTOS BY BOB MARTIN/JIM LIESEN

RADIO CONTROL SCHNEIDER CUP

by BOB MARTIN

THE FIRST HYDROPLANE was built in 1910, and, as with all other machines that move, it wasn't long before the second one was built, and a race was inevitable. Floatplanes (those set up on floats) and seaplanes or amphibians (those whose fuselage becomes the primary flotation) flourished and soon found an event in which they could compete, formally titled "La Coupe d'Aviation Maritime Jacques Schneider."

Jacques Schneider, the son of an armament manufacturer, was greatly interested in aviation. Although just a fledgling industry, he envisioned the potential value of seaplanes to transport cargo, and even people, across the ocean. In an effort to foster his idea and to encourage aircraft companies (most of which were very small and

SCHNEIDER CUP

Above: Richard Skoglund and Jean "Frenchy" LeBlanc jointly produced this Enya 1.20 4-stroke-powered Deperdussin. Model duplicates the full-scale winner of the first (1913) Schneider Cup race.

Left: Mario Castoldi's association with the Macchi factory proved legendary. The ultimate Schneider Racer (MC-72) was the last and the fastest ever built. After 55 years, the record of over 440mph remains unbroken for piston-powered seaplanes and the absolute propeller driven record, set by the unlimited racers of today, is but a mere 15-percent faster.

Right: Seen standing on the pontoon of the Navy version is Lt. James H. (Jimmy) Doolittle, with the Curtiss R3C-2, the winner for the U.S. in 1925.

Powered by a huge A-14 Fiat engine, this Macchi M-19 (1921) proved to have lateral stability problems in 1920 and was withdrawn from the race. In 1921, however, with the top Italian entry (the Savoia S.21) out, the M-19 was again entered (now modified with a longer tail and counterbalanced rudder) and did well until the crank broke late in the race and put it out of the race. It was the only two-man crew to ever race in the Schneider.

lacked funds for research) to direct their efforts toward developing seaplanes, Schneider announced he would offer a trophy and a cash purse to the winning entry in his new event.

Although Schneider envisioned the development of commercial cargo and passenger-carrying aircraft, the legacy of this event was the development of the most sophisticated racing aircraft in history. The Schneider Trophy races were the most prestigious air races in the world, drawing crowds of nearly a million. The winner not only won fame for himself and the aircraft company, but also earned his country the bragging rights as the best in the world.

Racing has a way of pushing technology along at a quickened pace. The prestige of winning this event brought amazing advancements in engines, airframes and aerodynamics. In 1913, Maurice Prevost won the Schneider Trophy flying a Deperdussin at a mere 45mph; in only 11 more events over a 19-year period, Schneider racers were capable of speeds over 400mph!

Jacques Schneider proposed that if any country won in three consecutive runnings, the trophy would be retired. Thus, in '31, the British won the event, uncontested, for the third consecutive time, and this famous race series came to an end—with the trophy forever in the possession of the British. The Americans won in '23 and hosted the event in '24, but the British, French and Italians were unable to field a single entry and requested a postponement until '25. Being the sporting folk we are, the event was declared void. We didn't sit idly by for the duration, however; with race planes ready to go, we simply went out and set a new world speed record. Again in '25, the Americans hosted the event, and Lt. Jimmy Doolittle won in a Curtiss R3C-2. Had the previous year counted, the coveted Schneider Trophy would have been the property of the USA.

During the running of the Schneider Trophy races, only France (once), the U.S.

(twice), Italy (three times) and Great Britain (six times) won the trophy. Although other countries designed and/or built aircraft for this event, Switzerland was the only other country that competed, finishing second to Britain in '14.

What impact did this event have on aviation history? In '34, the MC-72 (which was built for the '31 race but not finished in time) set an absolute, waterborne speed record of 440.681mph—a propeller-driven, record that stands unbroken to this day!

Enormous advancements in many areas of aeronautics were achieved, but it's generally agreed that the most significant advances were made in the area of engine development. The Curtiss engines would evolve into the Allison engines that powered the P-40, P-38, P-51, and others. The Fiat engines would power the famous Macchi aircraft of Italy, and, of course, the Rolls Royce engines would power British aircraft, including the famous Mosquito Bomber and Spitfire fighter.

With the incredible performance of the MC-72 in '34, one can only imagine the advances that would have been made had the races continued!

Why A Re-enactment?

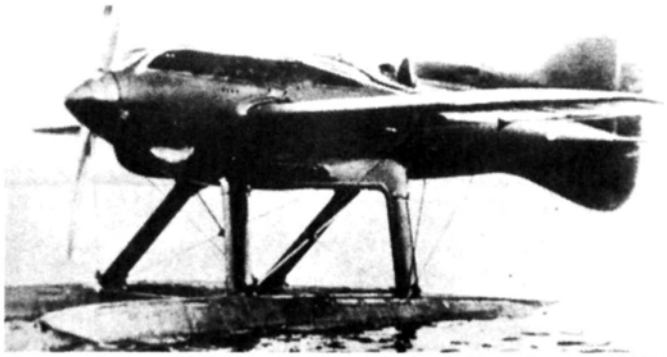
Aviation today is high-tech, but so were the Schneider racers. Today, engineers use computers to design, and, to some extent, they can test an aircraft's speed, handling and potential all within the computer, whose mass of electronic impulses allows the design engineers to evaluate, modify and constantly improve the design before one piece of metal is bent or cast. We would never be where we are today without computers to assist in designs or to guide us to the moon, but in the day of the Schneider racer, individuals had the opportunity to discover the unknown on a personal level. This was a time of heros, of daring men in their flying machines, when the aircraft was truly something special, and the Schneider racers were as special as they came.

Having a particular interest in this period, I thought it would be a great idea to build one of these unique racers. While researching the various aircraft, I noted that there were no kits or plans, at least not in the size *I* wanted to build. While discussing the upcoming London Bridge Seaplane Classic at one of our Desert Hawks R/C Club meetings, I brought up the subject and asked the club members if *they* knew of any plans or kits. The discussion that followed marked the inception of this unique event. And it seemed only natural to promote an event that has so much British involvement in a community whose famous landmark is the London Bridge.

Perhaps if the friendly folks of Lake Havasu City hadn't been so cooperative and helpful in past events, we wouldn't have been so willing to organize such an event. After all, consider the nature of the event and its restrictions: The aircraft must be of Schneider Cup heritage (in itself somewhat limiting) and giant scale (minimum 85-inch wingspan), and there were no plans or kits available anywhere in the world. Other considerations include the financial burden to the club

(Continued on page 106)

This Spad 20 Bis was entered in 1919, had nearly two feet sawed off of the top wing for more speed, but sprung leaks in one float and was disqualified.



Famous air racer Al Williams had to get private financing to build this Mercury in 1929. Built by the Naval Aircraft Factory, engine problems plagued this venture, but a new 24 cylinder X engine developing 1500hp was to be installed on the way to England. When the Navy Department refused to transport it to England to compete, all U.S. efforts in the Schneider ended.

In 1929, Castoldi improved his M-52 design to this Macchi M-67 and switched to the new, more powerful Isotta-Fraschini 1800hp engines in an effort to regain the Trophy. Although fast enough, engine fumes caused both to retire.

Designed and built by Bill Young, this Macchi M33 is one of a number built from Bill's plans. It has an 8-foot span, weighs under 30 pounds, and is ELECTRIC-powered! Bill will report on large electric operation in our upcoming electric issue.

Nick poses proudly with his "new" Swoose—configured for land operation. Either way, it makes for a great sport flier.

1989

SWOOSE

by NICK ZIROLI

This 1946 MAN design has been freshened up and modernized; proves good, basic designs are timeless.

SPECIFICATIONS

***Type**: Sport seaplane (convertible to land use)*
***Span:** 63 inches*
***Length**: (fuselage) 47 inches, (float) 38.75 inches*
***Weight:** 102 ounces*
***Wing Area:** 588 square inches*
***Wing Loading**: 25 ounces per square foot*
***Power Req'd:** .40-.50 2-stroke*
***No. of Channels Req'd:** 4*
***Materials:** Balsa and Ply*

Here's the '89 R/C version of the '46 Swoose. It's refreshing to see the graceful, flowing lines consisting of many sweeping curves rather than the more typically contemporary angular, box-like designs.

IF YOU'VE ever flown a model seaplane, you'll understand why they're becoming so popular. The addition of a set of floats to your present model will open a whole new dimension of R/C flying. Of course, with this new dimension come some new problems that will have to be solved.

The biggest problem is the medium itself: water. It positively will not mix with radio equipment, so every effort must be made to waterproof this equipment and seal the fuselage. Salt water is especially destructive and will almost certainly ruin a system. Wrapping the receiver and battery pack in plastic bags is an effective means of keeping water

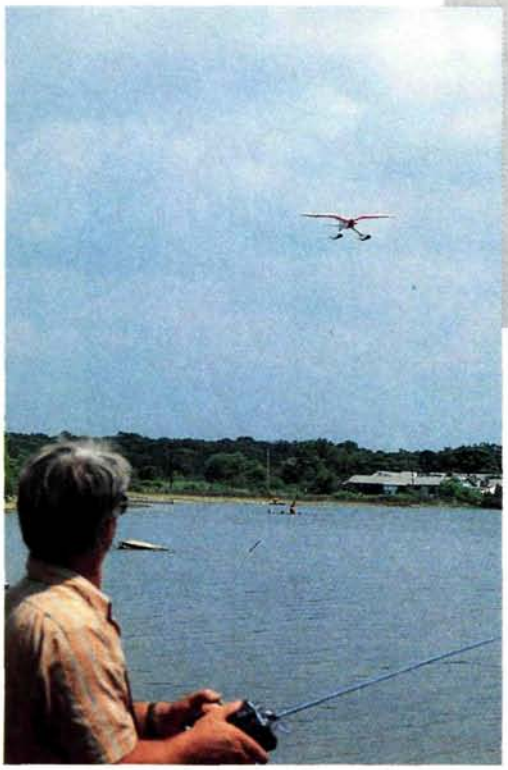
PHOTOS BY NICK ZIROLI/RICH URAVITCH

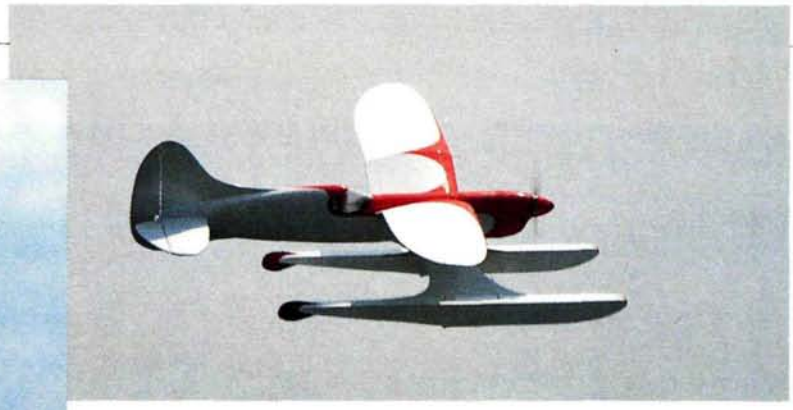
out. Servos are pretty well sealed, and they aren't usually a problem, unless they get a good soaking. A good wing-to-fuselage seal and "Gold-N-Rod," or similar type of pushrod, will solve most of the waterproofing problems.

The floats must be suited to the power, size and weight of the model they support. If they aren't, you'd better be sure your waterproofing is extra effective! Float angle and step location, relative to the model's CG, are just as important as a rigid mounting system. A small float deflection can be enough to make it dig in and dump the plane when traveling at high speed on the water. Recently, a lot has been written about seaplane flying and proper float installation. John "the Aquatic Guru" Sullivan has a lot to say about it in this issue.

I decided to build a new plane and to get involved with all the local seaplane activity. Actually, the design wasn't new; it was an old one. In the October '46 issue of *MAN*, there was an article on the Swoose, one of the sharpest looking little seaplanes that I'd ever seen. Designed by Capt. A. Stolzenberger as a free-flight, it was powered by an Atom .09 on ignition. It wasn't a scale model, but it was reminiscent of the old Schneider Cup racers of the '30s. Although I didn't build one then, the sleekness of the design stuck in my mind.

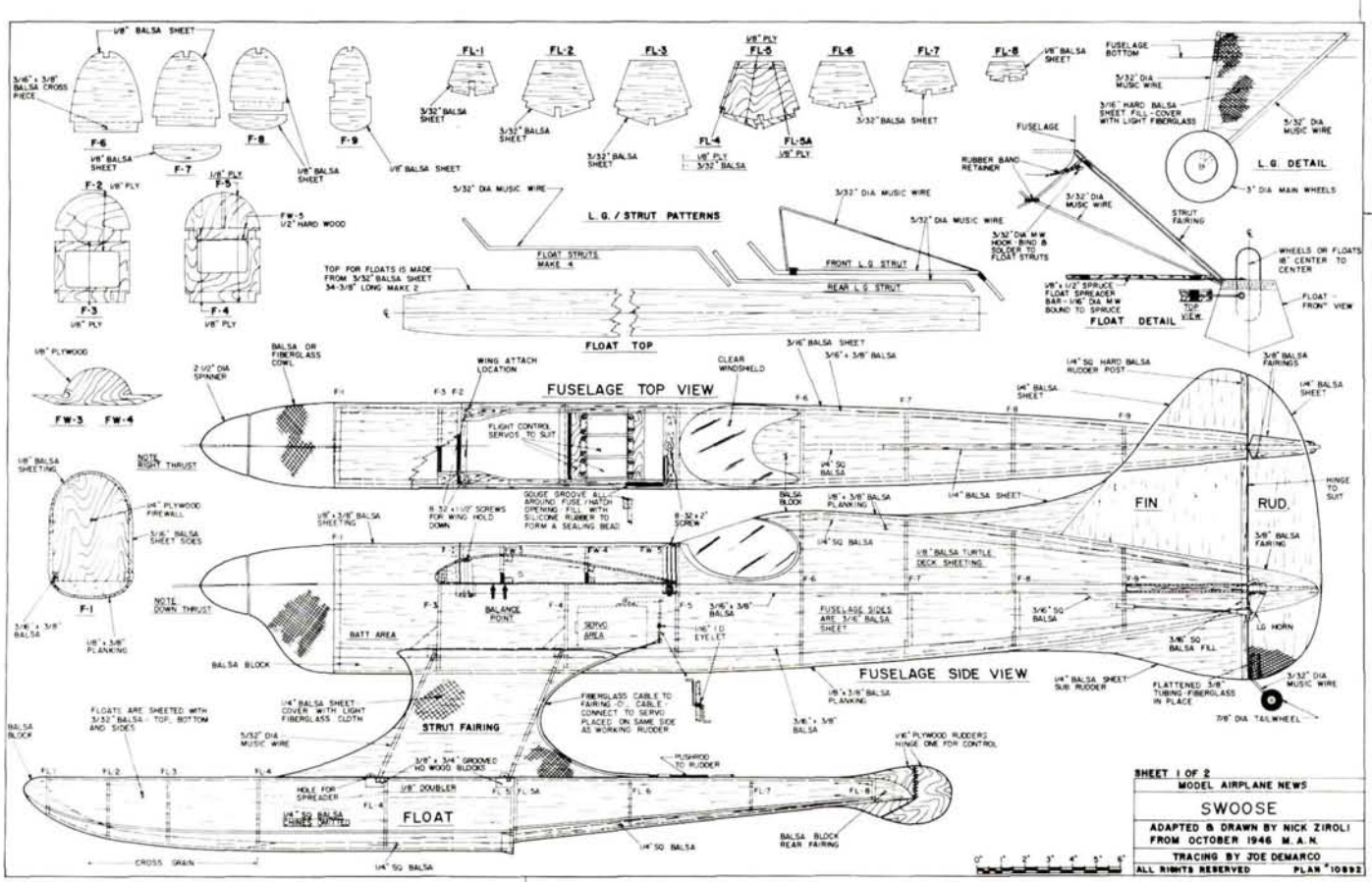
Thirteen years later, in '59, I built a Swoose as it was originally presented in *MAN*, but I added a few "modern" touches. A built-up sheet-balsa fuselage replaced the carved block of the original, and a McCoy .09 diesel displaced the

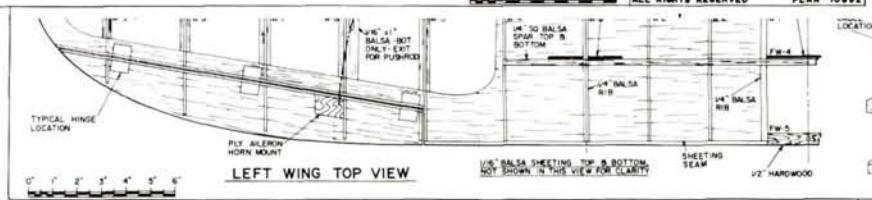


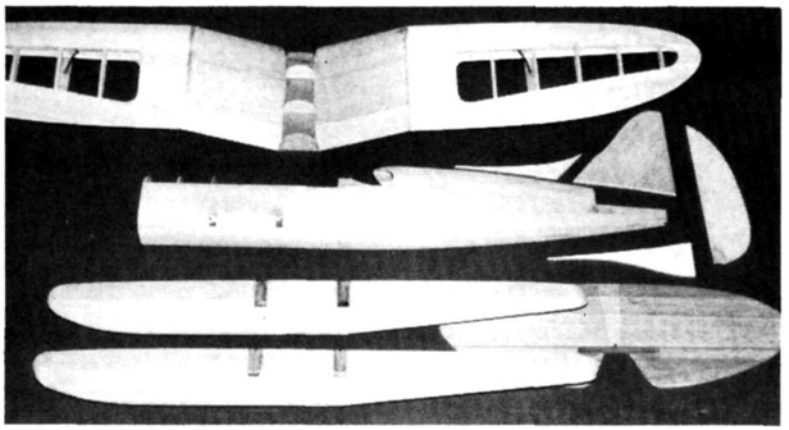


Atom. I got more kicks out of that little model than I thought possible. Picture a 31-inch-span all-balsa free flight powered by an .09 diesel, and you can imagine the exciting performance of this ship. There was no skyrocket climb; rather a long water-skimming takeoff, followed by a very fast shallow climb-out in large circles. A 30-second engine run put it almost out of sight. A de-thermalizer definitely wasn't required, as the descent was almost as fast as the ascent. It was truly an intriguing airplane that was literally flown to death.

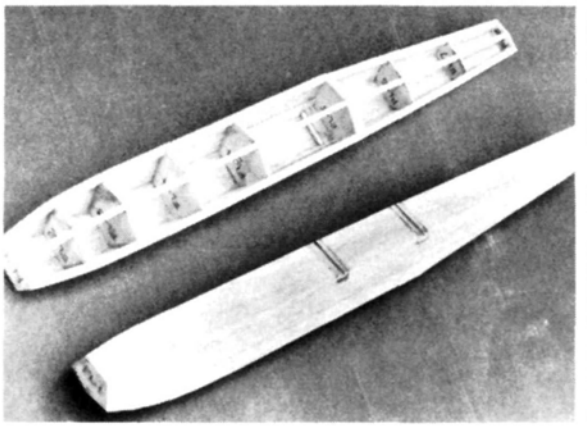
In '67, I built an R/C version of the Swoose. Adapting it to R/C required doubling the wingspan to 61 inches, since the original size was too small to be practical. (Sorry, Joe and Randy!) Float width was also increased for bet-







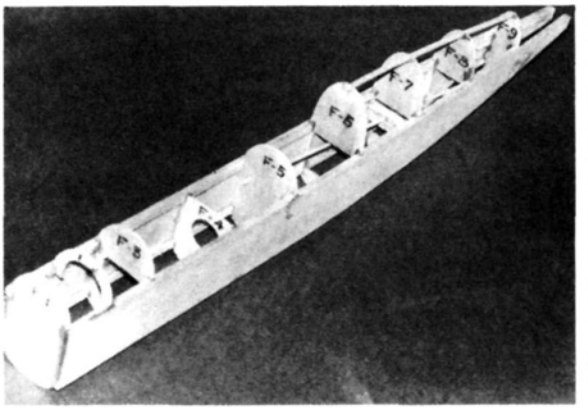
Basic assemblies framed up and ready for finishing. Wing may be left open and covered, or sheeted completely.



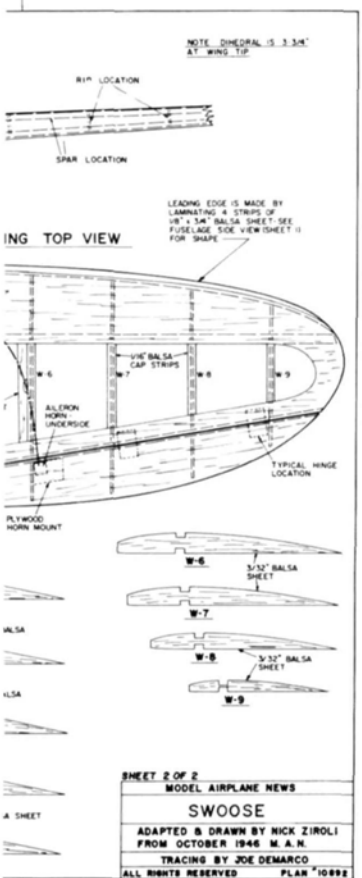
Top and bottom of nearly completed floats. Bottoms and tips remain to be added. Simple, strong structure.

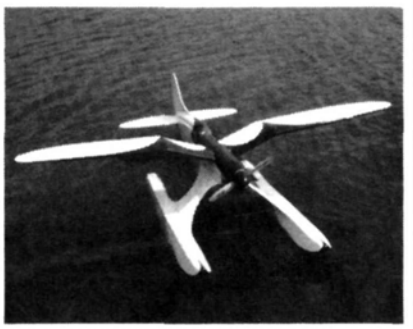
ter buoyancy. A screw-on wing (uncommon in '67) was used to form a watertight compartment that didn't allow a drop of water to reach the radio compartment. Even if the wings were broken off in a water crash, the center section was designed so that it would probably remain intact.

Since I wanted to do some of my flying over land, I decided to make the floats removable so that wheels could be installed—a worthwhile move, since it takes no longer than 2 minutes to reconfigure from sea to land or back. On occasion, I'd flown off a lake in the morning and gone directly to the field and flown the afternoon away on wheels. Excellent ground-handling characteristics were achieved by plugging a tail wheel into the bottom of the



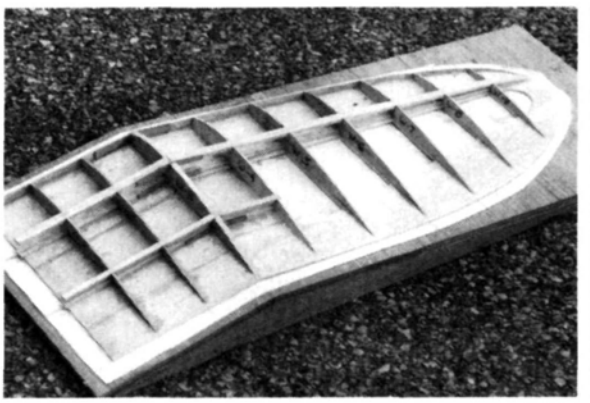
Framework of fuselage ready for top and bottom planking. Note offset in fire wall for right thrust.



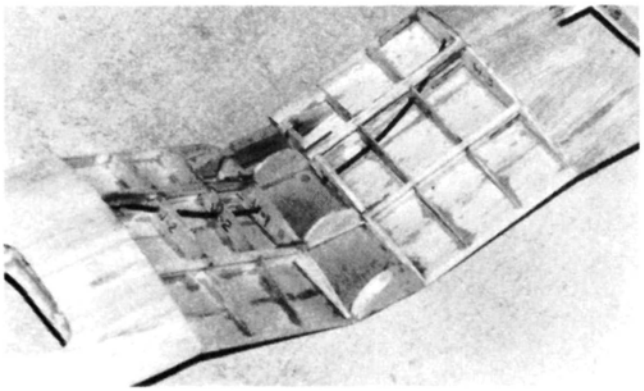


#10892 '89 Swoose $12.50

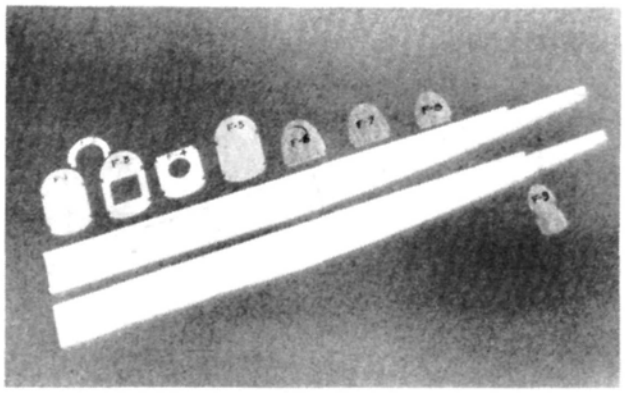
Nick Ziroli has taken a free-flight design that was originally presented in 1946, scaled it up, fitted it with a radio and produced a seaplane that will surely become a favorite with modelers. The most noticeable characteristic of this graceful bird is its inverted gull wing with an elliptical planform. Spanning 62 inches, the Swoose requires a .45 to .60 engine. The design is straightforward and easy to build. Balsa and plywood materials are used. Two detailed sheets.



A simple building board makes assembling the gull wing easy. Only one board is required for both wings.



Wings joined and final sheeting remains. Three screws secure wing to the fuselage for watertight radio compartment.



Most of fuselage parts ready to assemble. To save time, cut out all parts to make a kit.

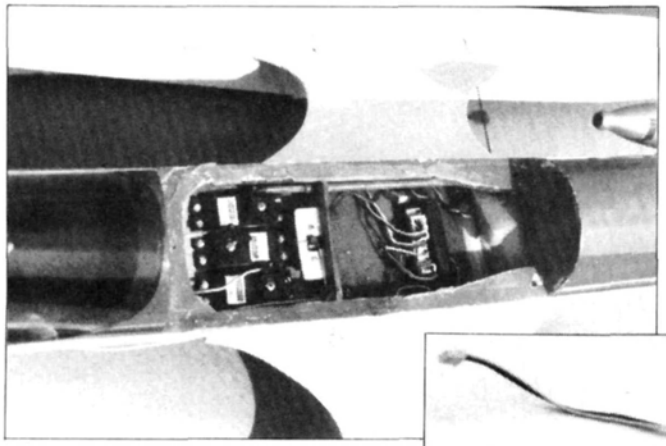
rudder.

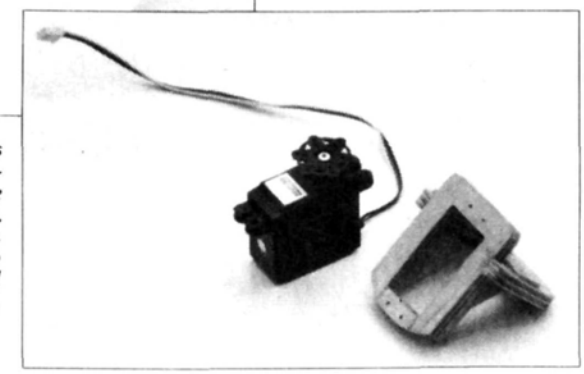
In '67, I flew the Swoose at the annual Brimfield, MA, Hydro Meet, which I believe is still held every year. Magazine coverage of that meet included photos of the Swoose, and to this day, I get an occasional inquiry asking what happened to this model. Modelers remember it. My '67 version of the Swoose was powered by an ST 51 and controlled by a Citizenship DP-3. Remember that one? No ailerons were used on the early version, and it really didn't require them. It was a very good 3-channel airplane, and the only major changes I made on my '89 version were to include ailerons, lengthen the nose, shorten the tail about 1 inch and invert the engine.

Construction of the Swoose shouldn't be too difficult for anyone who has scratch-built a plane or built a few kits. The flat-bottom wing is easy to build and performs well for this type model. The fuselage consists of sheet-balsa sides with planking top and bottom, which is the easiest method to use for a streamlined shape. A 1/16-inch sheet-covered stabilizer is used with solid 1/4-inch sheet elevators, fin and rudder. Looking like two basic fuselages, the floats are simple, rugged, and they make the whole project worthwhile. Building the wing center section and aligning the floats to the fuselage are the most difficult parts of the construction, but even they aren't major problems.

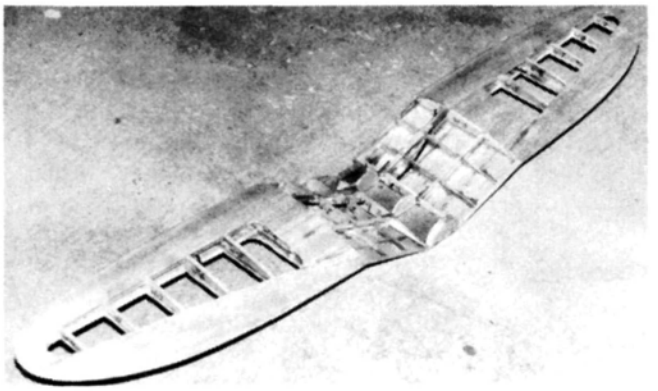
Many modelers prefer to prepare a complete kit of parts before they begin constructing a new project: a good approach that can save time. Superglues allow you to build as fast as you can put the parts into place. At least 90 percent of my Swoose is held together with CAs of different viscosities.

FUSELAGE: Cut the fuselage sides from 3/16x3-inch balsa, and glue the 3/16x3/8-inch longerons top and bottom to make a right and left side. A short splice will be necessary at the tail if 36-inch wood is used. Join the sides with F-1, 3, 4 and 5. Omit F-2 until the wing is fitted to the fuselage. When installing F-1 (the fire wall), make sure it's at the angle shown to obtain some right thrust. Pull the tail together with a 1/4-inch spacer between the sides where the tail post will be, and install the remaining formers. Cut out and glue the 1/8-inch sheet upper rear sides into place. Notch the fuselage sides for the 3/8x1/2-inch grooved hardwood blocks and epoxy them into place flush with the outside of the fuselage. Cut away the 3/16x3/8-inch longeron and epoxy 1/2-inch square hardwood wing-mount blocks into place as shown in the top view. Install Gold-N-Rod pushrods from F-5, exiting at F-9, as shown. Add the tail post, and plank the top and bottom with 1/8x3/8-inch strips. Attach the engine to a suitable motor mount and bolt it to the fire wall with No. 4-40 screws, washers and





Above: Three-abreast servo installation is no problem in nicely sized radio compartment. Switch actuated by wire to minimize water intrusion.
Right: Unique servo-mounting adapter, made from 1/4-inch ply, was employed to enable best possible connection with Nyrod pushrod system.



Elliptical wing planform is worth the little extra effort it requires. If you want 3-channel control, omit the ailerons.

The ol' master prepares the '89 Swoose for its test hop on the not-too-placid shores of Lake Ronkonkoma on Long Island.

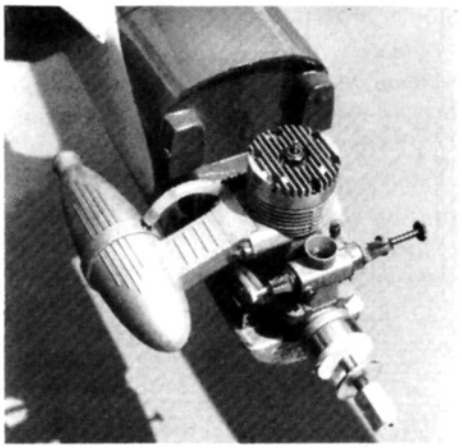
blind-nuts.

TAIL GROUP: Build the stabilizer by gluing the 3/16-inch outline and ribs to one 1/16-inch sheet surface cut to the outline. Use a regular slow-drying glue to attach the top stabilizer sheet, and hold it in place with a weight on a flat surface until it's dry. Cut out the 1/4-inch sheet fin, rudder and elevator parts. Join the elevators, and temporarily hinge them to the stabilizer.

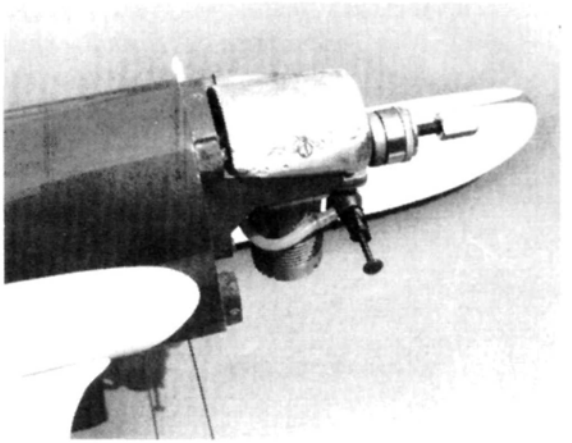
WING: The gull wing can be built in four separate pieces and joined, or built in two pieces on a simple building board, as I did. The wing consists of two flat boards at least 10 inches wide joined at the angle of the outer dihedral break. Cut out the bottom 3/32-inch sheet to the outline, then shape and pin it down over the plan. The outer panel can be sheeted entirely, or the center can be left open, and the ribs cap-stripped and covered with plastic or fabric. Add the bottom spars, ribs, joiners and leading-edge cap, and install the flexible Gold-N-Rod through the ribs. Lift the wing panel off the board so the pushrod conduit can extend through the bottom at the point shown on the plan. Cut the excess off flush with the bottom, and sand the leading-edge cap to match the ribs. Position the panel on the building board once again, and add the top spars, tapering them at the tip so they come together just inside the bottom sheet. Sheet the top of the wing, sand the leading edge sheet even with the 1/8-inch cap, and add the two 1/8x3/4-inch leading edges. Carve and sand them to shape.

Cut through the top and bottom sheet to remove the ailerons, install 1/4-inch-thick hinge blocks inside the upper sheeting and sand the hinge-line surface flat. Cap the opening with 3/32-inch sheet and sand it to match the top and bottom surface of the wing. Sand away enough of the front of the aileron to allow it to fit correctly into place with the 3/32-inch cap between it and the wing. (Note the angle to allow downward aileron deflection.) Install the 1/8-inch plywood horn mount plate and 1/4-inch hinge blocks, sand flush and glue the cap into place. Sand to match the outer surface. Cut the hinge slots, and temporarily hinge the aileron. Be careful here, as the hinges aren't the same distance from the top surface of the wing because of the curve. The center hinge is lower than the end ones. Keep all three in line.

Cut a 3 1/2x9-inch center-section bottom from 1/16-inch plywood. Place the wing panels against this on a flat surface with the trailing edges all in line. Block up the tips 3 3/4 inches and add the joiners and mounting blocks. Set the wing in place on the fuselage and glue F-2 in against FW-2, leaving enough space to allow for the finish and paint. After ensuring that the formers line up properly, plank over the top with 1/8-inch balsa. Don't obscure the holes in the mounting blocks. With the wing in the correct position, drill through these holes into the hardwood



Fox .50 ran very well, had remarkably reliable idle for a new, out-of-the-box engine. Upswept version of muffler available as well as the downswept version shown.



CG management by way of a shaped block of lead. Took nearly a pound! No problem running the new Fox .50 inverted.

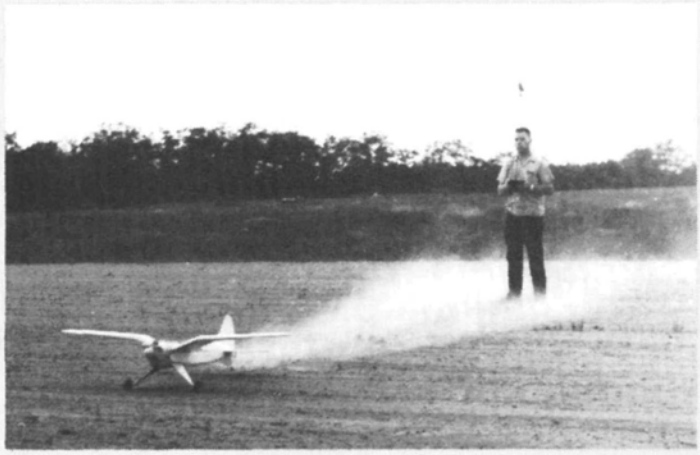
blocks in the fuselage. Tap the holes for No. 8-32 nylon bolts or install blind nuts in them.

Install the engine. The cowl can be made as simple or as complicated as you wish. I took the more difficult approach by carving blocks glued together around the engine to the shape I desired, removing it, covering it with clear plastic wrap, and fiberglassing it. When the carved block is removed, you have a cowl. Unfortunately, the carved cowl block must be made slightly smaller than the outside of the finished cowl to compensate for the thickness of the fiberglass, which is about 1/16 inch (not a particularly easy task). A much simpler approach would be to glue the side and top blocks permanently in place and carve them to shape so that they blend into the spinner. The bottom would be left entirely open for cooling and access to the engine. Your choice.

FLOATS: Build the floats by cutting out the top surfaces from 3/32-inch sheet balsa. Mark the location of all the formers and glue them into place. Pin the top surface to the edge of a piece of 3/4-inch wood that's the length of the floats. This will keep them straight while the stringers and sides are glued into place. Notch the sides, and epoxy the mounting blocks into place. Trim the sides even with the stringers, and add the bottom surfaces and tip blocks. Carve and sand the floats to shape and make sure you keep all the bottom corners sharp.

Bending a trial set of float struts to shape from coat hangers can save you wasting a lot of wire and time. Tack-glue a 1/4-inch strip of wood across the front and rear tips of the floats to hold them 18 inches apart from center line to center line. Block the floats up on a flat surface so their tops are parallel to it. Mount the fuselage to them on the trial struts. The object is to make the fuselage center line (use the wing-saddle face as a guide) parallel with the top of the floats and, at the same time, to locate the steps 7 1/2 to 7 3/4 inches aft of the fire wall. This takes some bending and adjusting to get it right. When you're satisfied, duplicate the struts in 5/32-inch music wire, and trial-fit to make sure they're correct. Epoxy the struts into the mounting blocks *on the floats* and, while still aligned, fill between the struts with 1/4-inch balsa. Bend the 1/16-inch wire spreaders to shape and fasten them to the top of the floats with sheet-metal screws. Add the front and rear strut fairings and sand

Some things age gracefully, and others become classics!!



Nick demonstrated the versatility of the Swoose design by fitting land gear to his first scaled-up version back in 1967. The dusty takeoff site is now overgrown with houses!!

Nick reversed the usual trend by having more hair now than he did 22 years ago, but note that the "flying outfit" remains pretty much the same! Both design and designer have longevity!

1967

1989

them to a streamline section. Since you're in the wire-bending mode, bend the landing-gear wires to shape, install them in the fuselage, then bind and solder them together. While still in the fuselage, epoxy the balsa fillers into place. The landing gear and float struts, including the area where they mount to the floats, should be fiberglassed with 2-ounce cloth.

COVERING, FINISHING & OUTFITTING: I covered the fuselage and floats with 3/4-ounce cloth and resin. The wings and stabilizer were covered with clear MonoKote* and painted with K&B* Super-Poxy. If MonoKote or other iron-on covering is used, cover the stabilizer and fuselage separately before installing the stab.

Install the servos, pushrods and horns. The aileron servo was difficult to mount. The original R/C Swoose didn't have ailerons, so it wasn't obvious to me that a servo wouldn't fit in the wing in the conventional manner. A plywood mount was made to orient the servo vertically, and that solved the problem. Water steering can be accomplished by incorporating either a movable rudder on one float or a rudder that plugs into the bottom of the air rudder in place of the tail wheel.

Balance the Swoose as shown on the plan. I hate to say it, but, to achieve this, mine took almost a pound of lead screwed to the top of the motor mount, so make every effort to build the tail surfaces and aft fuselage as light as possible. I used a Fox* 50 for power, and this has proven to be a very good engine with plenty of power and a good idle. The newer Fox carburetors (a vast improvement over the older models) are easy to adjust for both high and low speeds.

PERFORMANCE: Flying is easy off both land and water. We performed morning test flights at a local lake without a problem, and we did many touch-and-gos for the camera. That afternoon, we were at our field with the Swoose on wheels for some more photos. It flies equally well with floats or wheels, and ground and water handling are both very good. The aft ends of the floats sit low in the water, but the Swoose gets right up on the step, ready to fly very quickly. In the air, it's as acrobatic as I want. All the basic maneuvers and then some can be done very smoothly. If you like a racer-type sport model that looks as good on wheels as it does on floats, the Swoose may be the answer. The fact that it looks as good today as it did when I first saw it 43 years ago is a tribute to Capt. Stolzenberger's eye for a classic design.

Here's the original Swoose, reprinted from the October '46 issue of MAN. The wing had a bit more dihedral since there was no radio aboard to ensure "picture-perfect" flights, which, according to the article, most of them were!

**Here are the addresses of the manufacturers mentioned in this article:*
MonoKote; *distributed by Top Flite, 2635 S. Wabash Ave., Chicago, IL 60616.*
K & B Manufacturing, *12152 Woodruff Ave., Downey, CA 90241.*
Fox Manufacturing, *5305 Towson Ave., Fort Smith, AR 72901.* ■

Giant Steps

by DICK PHILLIPS

Sopwith Camel built by Mick Reeves from his own plans. Reeves is a three-time International Scale Champion with models like this. (Photo by Reeves.)

AS USUAL, I've received more plans since I wrote my last column. It isn't my intention to provide a plans review in every column, and my description of them will necessarily be rather brief, but I know many of you build from plans, and some of the ones I receive might not come to your notice.

One of the very best plans I've ever seen arrived recently. It was designed by an Italian engineer and is a *beauty*—worth hanging on the wall just to look at. The airplane is the Fieseler Storch (Fi 156 C-3), and it includes information that's adequate to the building of a museum-class flying model. Folding wings are included, as are all the STOL mechanisms of the original airplane. At 1/6 scale, it's a little shy of what we consider giant scale, but with its wingspan of over 7 feet, the Storch is impressive. The detail is mind-boggling: One of the four sheets of the plan is devoted to scale detail, and according to the measurements I've taken from the plan, it's accurately to scale.

There are a couple of minor problems: The plan is only available from Italy (and it's expensive by our standards), and it's annotated in Italian. Much of the text (and there isn't a lot of it) is fairly readily understandable by a model builder, however, and the plan is so well done that any really competent builder will be able to make a striking model from it. (And, let's face it: If you aren't a really capable modeler, you shouldn't even *consider* this one!) If you're interested in the plan, drop me a line and I'll put you in touch with the source.

I see *a lot* of plans in the course of publishing plans directories, and I've written detailed reviews of over 150 of them and have at least another 50 to go. This Italian plan is superbly drawn, has exquisite detail and looks great, and it would be difficult to stop admiring it and start building the model.

Another plan worth talking about is Mick Reeves's Sopwith Camel F1 at 1/4 scale. Mick is an English designer with an impressive line of credits to his name, and the plan is a beauty. While not *quite* at the level of the Storch, this plan is as good as anything you'll find among the usual plans available. It has plenty of detail, and although it isn't for the casual builder, it should be good for the scale competitor who wants a superb WW I model with which to campaign. Mick's plans are available in England, but a closer source is Bob Holman* in California. Bob handles a large assortment of offshore plans, and he probably has this one.

A third impressive plan arrived recently from DP Systems*. It's for the AD-3 (or -6) Skyraider at 1/5 scale, and it spans 96 inches. The five-sheet plan can be bought alone, or bought as part of a kit. Even if you're a WW II fan, you won't see this beauty at every scale contest in the country. Herb Hall who *is* DP Systems, has more goodies in the works and will be coming out with other plans (and kits) in the future. A catalog of his offerings is available for $2, and you get the two

bucks back on your first order.

These three plans represent a wide range of types: one WW I and two WW II airplanes (one German, one from the U.S.); two tactical airplanes and one utility airplane. All three plans are well done, and any one would make a superb model, depending on the skill and dedication of the builder—and that's what it all comes down to in the end, anyway!

Another entry comes from John Clark of Clark Airscrew* in Canada. John's unique Spitfire has been described here in the past, and I once mentioned that John was working on a Hurricane kit to complete a set of British Battle of Britain stalwarts. The Hurricane is well under way, as you can see by the photo. The model is by Bob Bolitsky of Kitchener, Ontario, and it's detailed as Douglas Bader's Hurricane. If the Hurricane flies as well as the Spitfire, and looks as good, John Clark will have another winner on his hands. The Spit used a pair of Quadra 50s connected end-to-end, and the engine was part of the kit package. Naturally, it was an *expensive* package, but one of the most *complete* I've heard of. Considering my next news, I'm not sure what John is considering as power for the Hurricane.

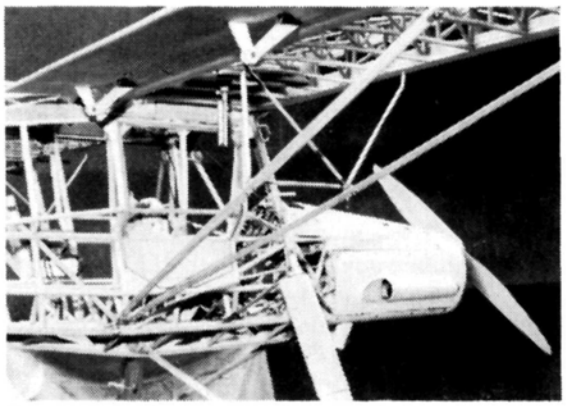


Photo of Fieseler Storch built by the designer from Italian plans described in column. Intricate detail and workmanship are obvious. Note that wings fold, and all STOL control surfaces work as on the original. (Photo from Cav. Sergio Spairani.)

Quadra Quits!

After a long and reasonably successful career, it seems that the Quadra engine is now now a thing of the past; I've heard that they're no longer being made, and I guess this news shouldn't have surprised anyone. During the last year, deliveries of the engines have been slow, and quantities have been limited. Dario Brisighella told me that he had almost given up trying to get enough engines to meet the demand for them.

Photo of prototype Hawker Hurricane kit from Clark Airscrew. Model built by Bob Bolitsky of Kitchener, Ontario, Canada. Hurricane is companion to Clark's previous Spitfire Kit. (Photo from Clark .)

During the years when the engines have been available, the company has undergone a number of changes, and the engines were recently bought out by a company called PETCO (an acronym for Plastic Engine Technology Company). PETCO apparently wanted to make some parts of the engines with modern plastics. This would probably have reduced the cost of both materials and production, but it wasn't to be. The Quadra line was introduced in the mid '70s, and the 2 c.i. model was all that was available at that time. Since people had been flying the Sid Morgan J-3 Cub on standard .60 glow engines (including one I know of on floats!), the arrival of the relatively powerful Quadra was a boon to those who built large models.

I had a Morgan Cub, and I powered it with a Quadra because it was the only engine available, and it was popular with "big" builders. Compared with the .60-powered versions I had seen, the airplane was a powerhouse. It flew quite comfortably on one-third throttle, or less. Designed to be a "throwaway" chain-saw engine, it was more than equal to the use we made of it, and I claimed that the average modeler would find it difficult to wear one out. I still have several (along with the subsequent Q50), and they'll probably serve me as long as I'm likely to live.

Every story has an ending, and it seems that the Quadra line has reached the end of its production life. Those still in existence will be around for a long time, however, and could even become collectors' items. Having been involved in their introduction to the modeling world in a '77 magazine article, I'm sorry to see them go; they've served us well for 12 years. There are now engines of a higher quality (and a *much* higher price!), and they do a great job, but the lowly and much maligned Quadra started things. It really helped those of us who wanted to build and fly large models, and it set the scene for the appearance of engines that came along later. R.I.P Quadra ! *[Editor's Note: Save your laments and wring out your crying towels. Late-breaking word is that Klaus Nowak will be handling the Quadra aircraft engines through his Quadra/Aerrow company. He can be reached at P.O. Box 189, Agin Court, Ontario, Canada M1S3B6. The other good news is that B&B Specialties, Inc. (14234 Cleveland Rd., Granger, IN 46530) will be the U.S. service center for Quadra. This will come as great news for all Giant Stepper/Quadra users!]*

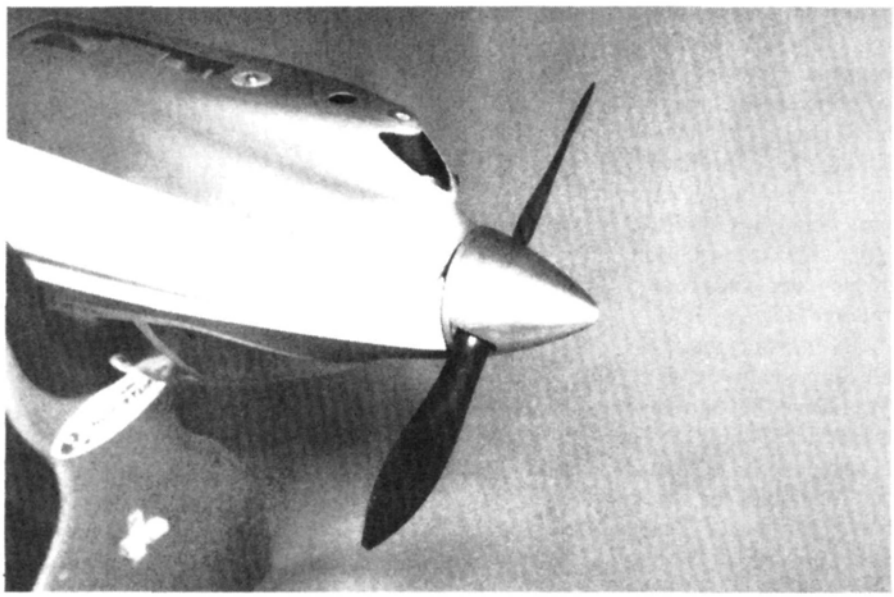
Miniature Membership

A couple of columns ago, I mentioned the International Miniature Aircraft Associa-

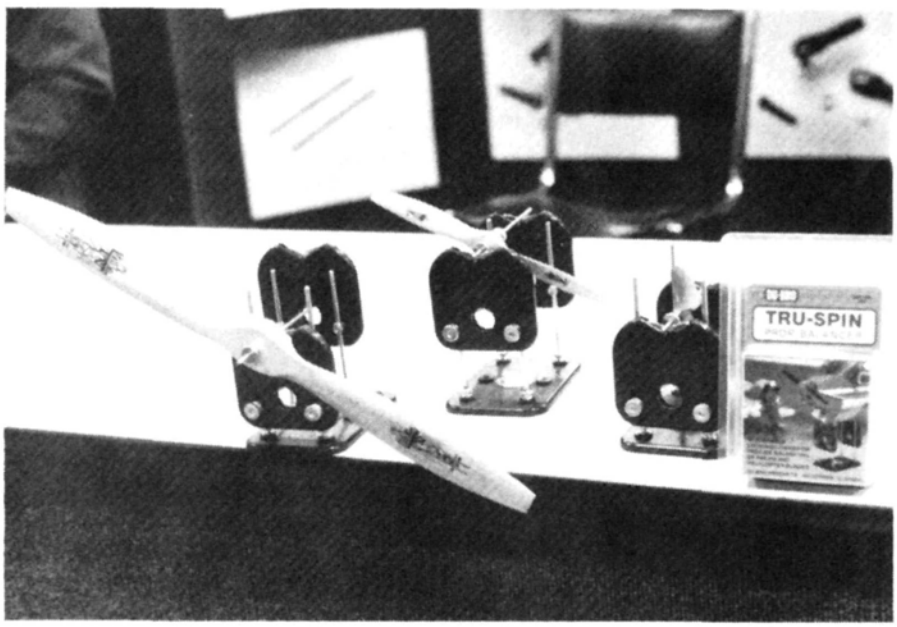
(Continued on page 109)

Pattern Matters

by MIKE LEE



Mounted to the front of the author's Aurora, the APC (Advanced Precision Composite) propeller prototype shows its unusual scimitar shape, which is efficient and very quiet.



The versatile, easy-to-adjust, Du-Bro Tru-Spin prop balancer is the right tool for balancing almost anything that spins. Perfect for a pattern prop.

I'VE TALKED about sound many times in this column, and I've discussed various ways to reduce sound levels in our pattern birds: more effective silencers and pipes; larger props with increased pitch; soft-mounting the engine; and dropping the operating rpm range of the engines. Now there's another breakthrough. This one is a new prop from Macks Models* that will be in full production by the time you read this column. Called the APC (Advanced Precision Composite) prop, it's a *very* interesting prop, indeed!

The prop has a scimitar-shaped profile that's pitched uniformly from about 3/4 inch from the hub all the way to the tip, and it has a slight gull-wing look, and it's markedly quieter than other props of similar size, both in the air and on the ground.

I tested one of the prototype APC props: an 11x12 carbon-reinforced composite prop. As you can see from the photos, this is one exotic-looking prop! The remarks from the field varied from, "Gee, is that really gonna work?" to a rather humorous, "That looks like something you'd find in a gang fight!" To be sure, this prop will garner you curiosity points at the field, and the in-flight results were mildly surprising.

On the ground, my Aurora ran up 11,000rpm with an Asano 12x10 narrow blade and an O.S. 61F-P engine. With a hard motor mount and a solid pipe mount, sound level was a disappointing 98dB at 3 meters. Switching to the APC prop, I lost 1000rpm and had to lengthen the pipe 1 inch to keep it going on the pipe. Sound level was down to 95dB on the ground.

In the air, the Asano provided bristling performance and unlimited vertical power. Sound was average, but I didn't measure it to find out for sure. Switching to the APC prop, the straight-line performance was the same, but I lost the unlimited vertical performance as the prop lugged down. I needed another inch of pipe, which the Aurora wouldn't let me

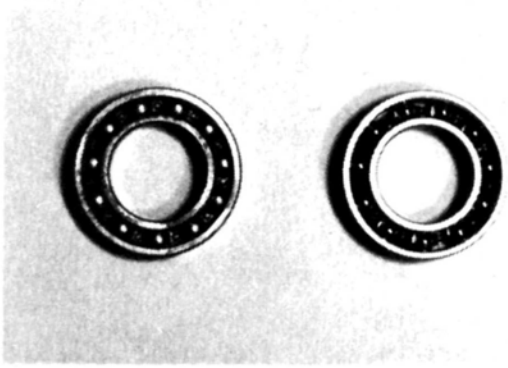
(Continued on page 58)

PATTERN MATTERS

(Continued from page 54)

have. With this prop, the in-flight sound was *way* down. This is significant, because the engine is hard-mounted, and this is the worst thing possible for trying to keep things quiet, yet the Aurora was, in fact, markedly quieter with the APC prop. Hmmm, methinks we have something here! Anyway, that's the result of my testing; I think that the APC prop is worth looking at.

Another breakthrough item coming your way has to do with bearings. Yes, we've all suffered our high-powered pattern engines spitting out a bearing every once in a while, as well as getting a case of the rusty balls. At any rate, we're faced with having to put up with a bearing change at least once a season, if not more often, and the classic case is where the bearing race flies apart because the ball cage has failed. If you're really lucky, you can keep the main portion of the engine's guts.



Above: The LCS Performance Kevlar-composite, caged ball bearing (right), compared with a standard, all-metal, caged ball bearing from an O.S. .61RF engine. The new bearing can withstand twice the rpm load without catastrophic failure.
Right: M.A.P. Products' foam receiver pack is a neat idea for any aircraft installation. Velcro straps allow it fit virtually any receiver or battery pack.

I recently met Lewis Schwab, who operates a business called LCS Performance*. Lewis, who apparently is very hip to the fact that bearings come and go with unerring regularity, has introduced a new bearing that's built with Kevlar-reinforced ball cages, thus eliminating the older, metal ball cage. This bearing can withstand twice as many rpms as previous ones, and they'll last a whole lot longer—perhaps for the life of the engine (especially knowing the way I fly!). The bearings we use now are rated between 12,000 and 15,000rpm (most of them down at the lower end). When we tell bearing guys that we're going to rev up to 16 grand in the air, most of them cringe, but the LCS bearing will be able to take that load in style.

The LCS bearings are available for almost all popular .60 and .61 engines now in use. Call LCS for further information on pricing and availability.

By the way, Lewis passed on some timely information: O.S. Max long-strokes have been pounding the bearings into the cases owing to the excessive radial loads inflicted by the design. The result is premature bearing failure, and we O.S. fans have to change our bearings again. This problem only shows up after exceeding 13,500rpm, and there's nothing in the bearing design to prevent it. O.S. recognizes the problem and now has a new bearing and crankcase to cure it. The part number for the case is OSMG4355 and the bearing is OSMG3108.

Meanwhile, for those of us who will continue to use what we have, Lewis advises us to do the following things:

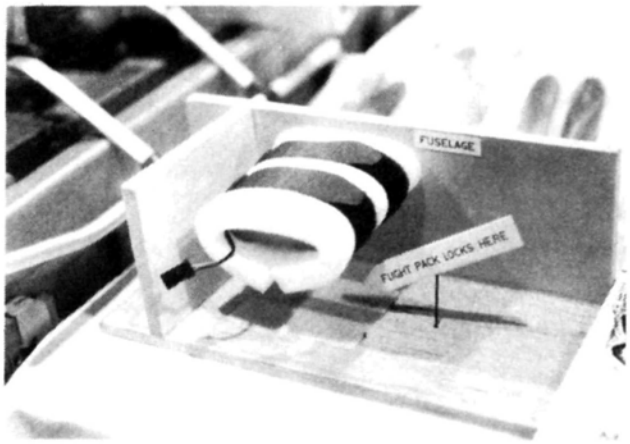
- Of course, he recommends *his* bearing. (Boy, I saw that coming a mile away!)
- Use 10-percent nitro or lower. High nitro tends to detonate, or pre-ignite, and this flogs the engine case and bearing to death.
- Prop the engine to run around the 11,000 to 11,500rpm range on the ground. This will unload to just about the 13,500 mark, and it will prevent the bearing-pounding effect.
- On start-up, allow the engine to idle for 15 to 20 seconds before throttling up. This will allow an even lubrication of the bearings and ensure a proper running condition. This is something *all of us* should be doing *on all engines!* (That's the best advice I've read yet.)

I thank Lewis for that information. Hope that you all got something out of it as well.

Do you all remember the High Point Balancer? Yes, that neat little table-top balancer that took tinkering to a new high. Well, a similar little device is now available from Du-Bro*. Called the Tru-Spin Prop Balancer, Du-Bro has made it even more versatile. It will accommodate almost any size of prop; its height and width are adjustable; and it's almost unbreakable. As you can see from the photos, the Tru-Spin Balancer is quite compact, and it should handle anything we pattern fliers can throw at it. Now, for those humongous 1/4-scale props...I think you'd better think about that one. Contact your dealer or drop a line to Robart*.

I was recently exposed to another of R/C's little raw moments in life. If you've been playing the game of R/C long enough, you'll know that someone out there has your number. You can fly on 72Mhz or 53Mhz; early in the morning or late in the evening. No matter what you fly, someone out there has the ability to shoot you down with another transmitter.

Having been a victim of that raw moment several times over my flying career, I decided that in my workshop, I had the stuff to make my own frequency monitor.



Basically, the monitor is simply an old receiver hooked up to a missing-pulse detector and a small 4.8V source. For the receiver, an economical Challenger receiver from Polk's* filled the bill. Any receiver on the same band as your transmitter will work: wide-band or narrow-band; AM or FM.

The second item—the missing-pulse detector—is actually the McDaniel R/C Sonic Alarm. This is a noise-maker that was developed primarily for helping to find a downed aircraft in woods or bush. Turn off the transmitter, and a piezoelectric buzzer sounds, leading you to the ship (or wreckage!). The 4.8V source could be any 4-cell pack that you have hanging around.

To make this, hook up the Sonic Alarm to plug into the receiver on any channel. (It doesn't matter which channel, because there's nothing else going to the receiver anyway.) Plug the battery into the re-

(Continued on page 111)

G&P

GRUMMAN ALBATROSS

by JOHN SULLIVAN

A fiberglass, twin-engine scale amphibian that flies great...you may be running out of reasons for not trying seaplanes!!

BILL PRICE OF G & P Sales* has created a unique niche in the hobby market. His first offering, the .40-size PBY-5A Catalina was well received, and with the introduction of his twin .40-powered Albatross HU-16B, he's fast becoming the industry's twin amphibian expert. The full-scale HU-16B (see sidebar) that Bill chose to model was the result of 15 years of modification and refinement by Grumman.

THE KIT: Everything comes directly from the manufacturer and the contents are bagged, collated and tightly packed to prevent damage. Spars, doublers and reinforcement plates are hand-cut from 1/8-inch mahogany plywood, which has much higher impact strength, yet weighs almost the same as poplar. The sheeting, blocks and leading and trailing edges are straight medium-density, good-quality balsa. The flying surfaces are hot-wired from 1-pound-per-cubic-foot polystyrene foam plugs that have been molded with vacuum assist. The material is crisp and has a tight surface that can be sanded easily, and it's free of the warps and bows that are often found in poor-quality polystyrenes.

The white fuselage is light, but tough, and a joy to behold. There are no surface pinholes because a pigmented gel-coat is sprayed into the molds and cured *before* the mat and woven glass are applied. Also included in the kit are the usual bags of hardware, miscellaneous blocks and dowels, and plenty of

SPECIFICATIONS

Type: *Scale twin amphibian*
Wingspan: *84 inches*
Weight: *13 pounds (14.4 with retracts)*
Wing Area: *810 square Inches*
Wing Loading: *36.9 ounces per square foot*
Power Req'd: *Two .40 2-strokes (1hp each)*
No. of Channels Req'd: *6 (with retracts)*
Suggested Retail: *$259.95 (plane & hardware)*
$169.95 (retracts with actuators)
$ 24.95 (2-hour construction video)
Features: *Flaps, scale retracts, joined glass fuselage, foam wings, ABS cowls and nacelles, hand-cut parts, accessory list with order numbers.*
Comments: *A well thought out, highly prefabricated kit. Some unusual assembly techniques but instructions point them out. Excellent fiberglass work. A twin that isn't intimidating.*

PHOTOS BY JOHN SULLIVAN

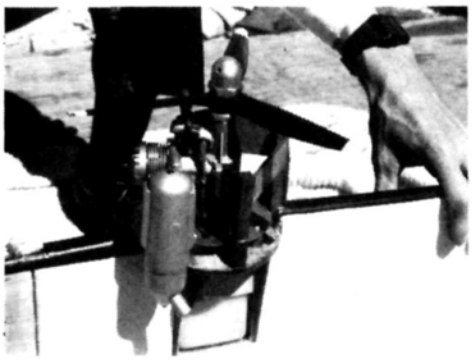
ABS vacuum-formed nacelles and cowl rings. There are no plans as such, but the 21-page instruction book is well illustrated with step-by-step detailed drawings, and it includes full-size patterns for the parts that have to be cut.

CONSTRUCTION: The Albatross falls between an ARF and a completely built-up model. The manufacturer's objective was to simplify building, leaving the assembly, preparation, outfitting and finishing to the builder. Some of this stuff *is* tricky, e.g., soldering up the internal elevator horns, and I highly recommend that you watch the two-hour video, because it's helpful to see the assembly process (it's almost like having the designer with you in your shop!).

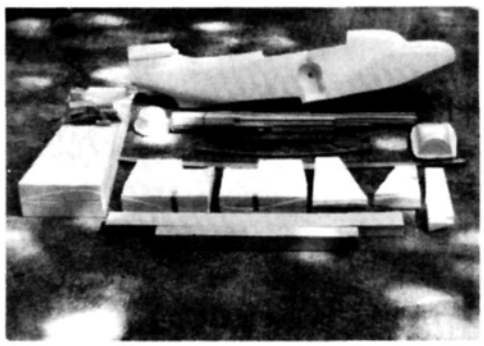
First, remove any wax residue from the fuselage with naphtha solvent (available as "Energene" in supermarkets). The fuselage comes joined from the inside with polyester and glass tape, but you'll have to putty and sand the joint for a smooth finish. If you choose the color scheme shown, you can float white lacquer on the seam. Leave the white areas alone, and add black and red trim.

Next, install the internal elevator horn and water rudder, because access becomes more limited as the

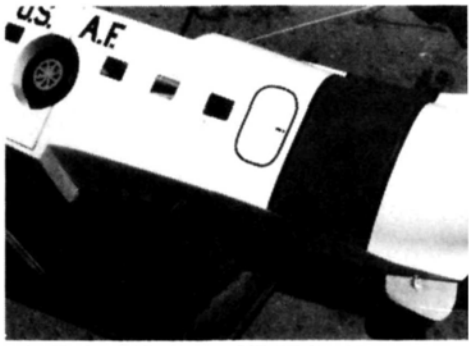
ALBATROSS



O.S. 40 installation features supplied Lord mount. Note three-blade prop and tank installation.



Grumman Albatross kit contents. Complex aircraft has been reduced to a very low parts count.



Rudder installation on G&P Sales Grumman Albatross. Not scale, but very essential.

project takes shape. Sheet the stab, fin, elevator and rudder; then epoxy them to the empennage root. This is pretty standard stuff, and it goes quickly. The parts count will be way down here, as the stab spar is also the stab trailing edge. With the empennage completed, move on to wing-saddle construction, bulkhead placement and the installation of the servo rails for the rudder and elevator servos. Apart from windows and exterior finish, if you don't install the retract kit, that's about it for the fuselage.

The wing is like a busy intersection: Everything seems to come together here. The foam cores for the wing come in two outboard and one center panel. The spar slots and spars are already cut, and the first step is to glue the major parts together with epoxy. The spar also

GRUMMAN ALBATROSS-MILITARY OR CIVILIAN

An SA-16B Grumman Albatross, modified for luxury passenger service, blasts past a cruise liner in the Bahamas.

RESPONDING TO A NAVY requirement to replace its aging fleet of PBY Catalinas and J3F Gooses, Grumman Aircraft Co. flew its first Albatross (the prototype G-64) on October 24, '47. Considerably larger than its predecessor, the Mallard, the Albatross had a wingspan of 80 feet and was powered by two 1425hp Wright 9-cylinder radials. It incorporated many improvements to its hydrodynamics and aerodynamics, and these reduced drag and improved performance, both on the water and in the air.

The Albatross was designed to operate from 4- to 6-foot waves, but with four JATO units, it could also handle takeoffs from much heavier seas. The JATO units were attached to access and emergency hatches on the port and starboard sides, and they delivered a combined 4,000 pounds of thrust for 15 seconds, which reduced the takeoff run by a whopping 40 percent. Reversible-pitch propellers made the Albatross exceptionally maneuverable on the water, and that's a useful characteristic for the air/sea rescue role in which it gained universal recognition during the Korean War.

During more than 15 years of production, the Albatross was modified dozens of times (with attendant designation changes) to serve as patrol bomber, radar scout, search and rescue vessel, oceanographic research ship, Coast Guard patrol, bulk carrier and luxury passenger amphibian.

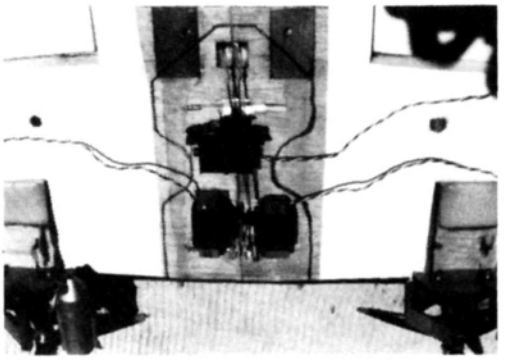
The bulk of the designations had the SA-16A format as their basic design, but in '56, the final major revision took to the air as the SA-16B. The 16B had a wingspan increased by almost 17 feet, with cambered wing leading edges and high-pressure de-icing boots. The areas of the fin and rudder were also increased, but overall drag was reduced by "internalizing" the nu-

Prototype spray-rail installation. Kit contains complete instructions.

serves as the foundation for the motor-mount assemblies that are glued into the cavities already cut in the foam cores. Install the hold-down plates, the tip float, the strut plates, the dowels, etc., along with the Nyrods (not supplied) for flap, aileron and throttle linkage. The location and sweep of the Nyrods are shown on illustrations, so you can feel good about installing them even before the flaps and ailerons have been cut out. Keep in mind that all these components will be sheeted, so don't worry if things look a little messy at this stage.

Install the leading and trailing edges. The sheeting is next, and it's here that you should be careful. Get someone to help you, because the wing must be pressed down over support blocks to bend in 1/4-inch of washout at the wing tips *while* the wing is being sheeted. This sounds difficult, but it isn't really—as long as you have *four* hands in the soup. This step is essential to the Albatross's performance, especially on landing approaches and turns on final with flaps dialed-in.

Now that the wing is basically to-



Albatross wing center panel. Flap and aileron servos forward and throttle servo aft. Note LE dowels and TE hold-down plates.

N AGELESS WORKHORSE

...it appears that the Albatross will become the waterborne equivalent of the DC-3—

merous antennas that had sprouted from the wings and cabin roof over the years.

Finally, each of the tip floats was moved outboard 70 inches, and Wright 1525hp radials were installed. As a result, climb rate and cruise speed were increased while stall speed was reduced, and the Albatross's range was increased from 2,683 to 3,282 miles—incredible!

Perhaps the only drawbacks of the Albatross were its poorly insulated cabin area and the roar of the twin radials, which contributed greatly to pilot fatigue. Many missions lasted as long as 24 hours, and a large supply of cotton was kept on board to help protect the crew's ears.

Nevertheless, the Albatross has proven to be one of the most rugged and durable amphibians of all time. An example of its many accomplishments is the time in '56 when an Albatross was called out to search for a B-26 Invader that had been reported missing over the South China Seas. After spotting one of the Invader's crew afloat in heavy seas with nothing but a Mae West for life support, the pilot decided to attempt a landing before losing sight of the lone survivor. After a safe landing, it was quickly determined that a takeoff was impossible, even with JATO assist, and the Albatross was forced to taxi back through 8- to 10-foot seas to its base in Okinawa, Japan—98 miles away!

Like many of the world's great amphibians, the Albatross has been steadily replaced by the more versatile helicopter, and yet, as late as '86, there were still over 50 of these durable workhorses operating with some seven air forces and navies around the world. Hundreds more remain in a service of a more genteel nature: working for the Coast Guard, the Smithsonian, The Cousteau Society, various Alaskan enterprises, and even Resorts International in the Bahamas, which has a fleet of 13 highly modified Albatross amphibians.

It's now more than 40 years since the last of Grumman's classic flying boats took to the air, and it appears that the Albatross will become the waterborne equivalent of the DC-3—another of aviation's great survivors that continues to earn a living and inspire present generations long after its contemporaries have faded into history.

If you'd like more information, these books are recommended: *The American Flying Boat*, by Richard C. Knott; *Flying Boats and Amphibians Since 1945*, by David Oliver, Naval Institute Press Annapolis, MD 21402. ■

Completed radio bay has good access. Note silicone wing saddle and wrapped receiver.

gether, finish the tank and engine bays, install a doweled leading-edge spar where the wing center section butts the fuselage, and cut out the flaps and spars. Complete the control surfaces by adding the leading edges, horns, tips, etc. Locate the Nyrods with a pin, and get them ready for final linkage. The instructions emphasize that successful twin operation starts with slop-free linkage with identical axes and swing. Bear down here, and do the best you can.

After the wing has been sanded and the engine and tank bays fuelproofed, all that's left is some fussy detailing work. Now you have this fantastic amphibian sitting on your workbench.

After WW II, the Albatross was painted in highly visible colors when used for rescue missions. Have a good time with the color scheme, and get splashy. When this plane comes cookin' by at 60mph, you don't want to see *anyone* staring at the ground! Keep your covering scheme as light as possible. The Albatross has a high-aspect-ratio wing and carries its weight well, but avoid glass-cloth and paint as much as possible and go with the iron-on coverings for color.

Please note that my test model wasn't equipped with a retract system, although one is available for this model. The system is simple, it adheres to scale, and it operates flawlessly when it's set up according to the supplied instructions, which are well-illustrated. Some silver-soldering is required, and the nose gear, although straightforward, is a bear to install.

Glass and sheeted foam tail group on Albatross. Note antenna routing.

Our regular flying site doesn't accommodate land-based operations, so we didn't fly off land for this review. The Albatross will land on ground some time before this article appears in print, as Bill Price of G&P Sales plans to enter the Albatross in the Woodland Sea/Land Scale Classic, which I'll report on later.

PERFORMANCE: Bill lives nearby, and I fly with him at weekends. I'm notorious for my lack of flying skill, but I can't be stopped! I fly all the time (carefully) and haven't wrecked a plane in four years, but I'm still not the one to rely on for Lomcevak information. After talking to Bill, and using the sticks myself, I'm confident that if you can fly

a sweet stick, you can fly the Albatross. Twin-engine operation aside, this is a good flying machine. It tracks like a pattern ship and goes exactly where you point it. On the other hand, the Albatross has no dihedral-type "pause that refreshes" attributes. Pay attention to what you're doing; if you've trained yourself to fly this way, you'll have a lot of fun with the Albatross.

Takeoffs are demonstrations of sheer power! Slam the stick forward, and that big hull blasts through the spray (almost ignoring the hump phase) with the twins turning up as the Albatross rockets across the lake. Speed is important on takeoff, so just let it happen. The Albatross loves going down a straight line on a step run, and the faster it goes, the less *you* have to worry about torque pulling it off to the left.

When you're up to speed, just think about up-elevator and you'll be airborne. Climb-out is solid and very reassuring, and turns can be held with just a little elevator.

The Albatross maintains a natural attitude in the air. You never get the impression that the plane is fighting any kind of adverse incidence setup, and pitching or ballooning isn't really a concern throughout the speed envelope. Purists might object to this, but Bill looped and rolled the Albatross on its third test flight. It did an admirable job with plenty of power over the top, but its real charm is shown with a high-speed, swooping flyby or a nice, slow saunter with flaps deployed 20 degrees.

There's a lengthy explanation of the model's flying characteristics in the instructions, and the video has unedited footage of its first three test flights. Building and flying a twin has always been considered a challenge and a natural step for those who welcome complexity. Bill Price has come up with a waterborne twin that will save you time and help you avoid the inevitable damage that results from land-based operations. The Albatross is a tough, sweet-flying machine with as much—or more—charisma than any other twin on the market. For those of you who are ready to take this one on, I highly recommend the concept, the kit and the manufacturer.

**Here's the address of the manufacturer featured in this article:*
***G & P Sales,** 410 College Ave. Angwin, CA 94508.* ■

FLOAT GEAR & RUDDER SYSTEMS

by John Sullivan

How To Size, Rig and Install Water Gear On Nearly Any Size Airplane

IT GOES WITHOUT SAYING that mounting floats is considerably more difficult than installing land-based gear. If you're building a kit with land gear, all the work has been done for you; if you're scratch-building, there's a plethora of products out there you can simply order and install. Not so with floatplanes. Those of you who have already wet your feet have proved to be (as usual) very creative and innovative. In the September '88 and October '89 float "specials," we covered float design and airframe conversion, respectively; now it's time to fill the gap and talk about adequate gear and pattern design.

The basic requirement for a float-gear system is that it should provide a correct attitudinal relationship between the fuselage and floats with enough rigidity to preserve that relationship in normal operating conditions. If you build beyond those parameters, you'll only be adding weight—weight that might *contribute* to a crash, or create unnecessary drag.

When a floatplane sets down on final or enters a high-speed step turn, three forces come into play: shear, spread and side load. The shear force occurs because the floats, having met with the water, want to decelerate faster than the fuselage to which they're attached. The spread force occurs because the weight of the airframe wants to continue downward to the water, pushing the floats aside. Side loads occur in a high-speed turn when the weight of the plane wants to proscribe a wider arc than the floats are navigating and tries to rip the gear off the float deck or twist the attach points.

This article will consider four types of float gear:

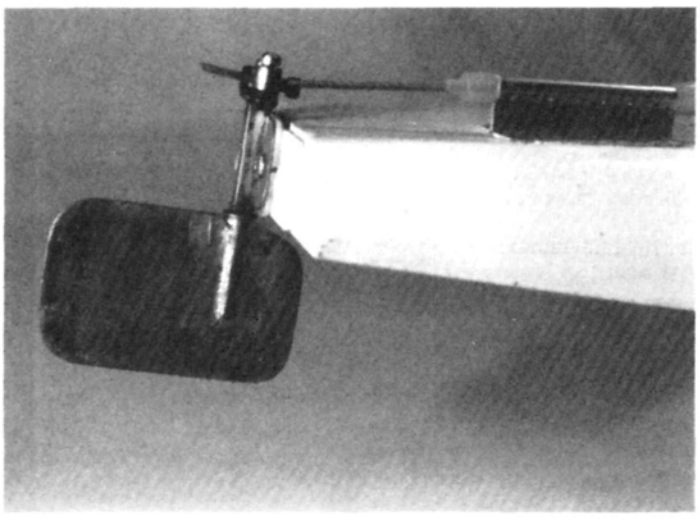
- commercially available landing-gear blanks
- soldered music-wire gear
- scratch-built aluminum gear blanks
- built-up composite gear.

For each type, I'll address flexibility, shear, spread and side loads, but first, let's consider attach points and attitude.

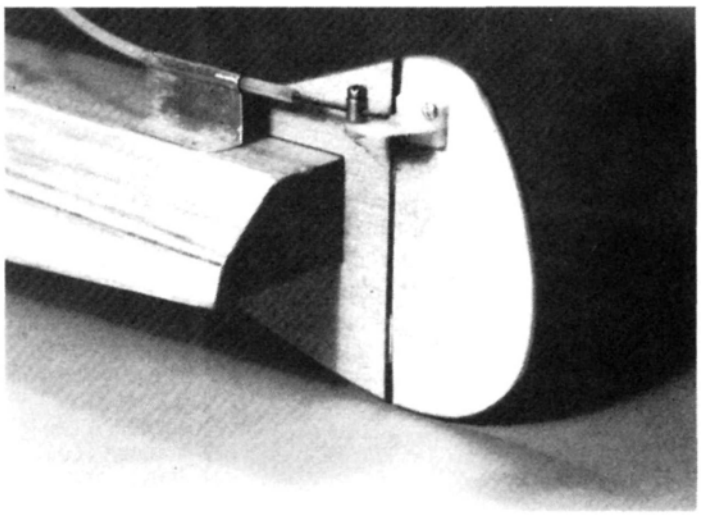
Attach points can be as simple as 1/8-inch ply stiffeners in the fuselage floor and 3/8-inch ply plates embedded in, or on the surface of, the float decks. Because we're attaching to four points on both the fuse and floats, it isn't necessary to build heavier than that, except on floatplanes exceeding a total weight of approximately 20 pounds. What's more, with this setup, you might find that on an average bad landing, you'll merely rip out screws, allowing you to refasten and fly again if the float system and airframe have separated intact.

Determining the attitudinal relationship is also easy if you follow four basic guidelines:

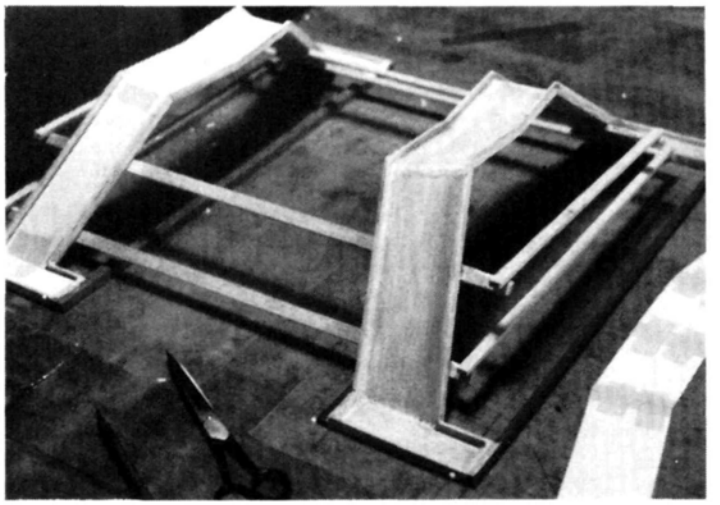
1) The tops of the float decks should be *parallel* to the horizontal stab or the fuselage datum line. Don't droop the floats, as is done in full-scale applications. Model floatplanes have scads more power than their full-scale cousins, and we don't need high angles of attack for takeoff. In fact, a high angle of attack may cause a model with reduced Reynolds efficiency



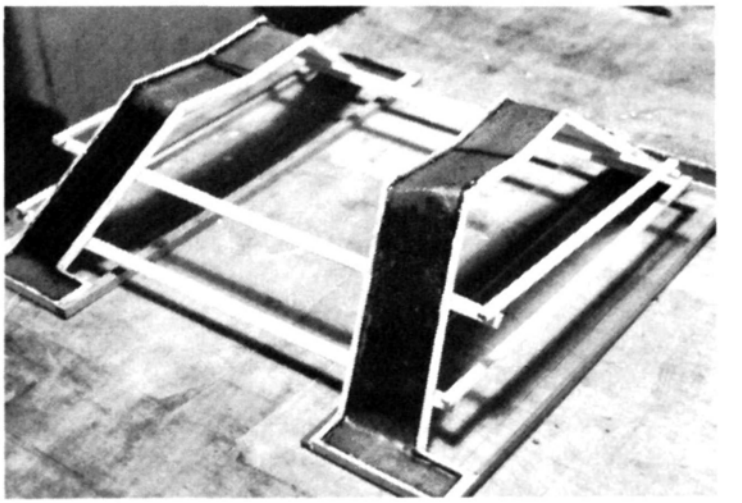
Scratch-built rudder made of sheet-metal plates and square and round brass tube stock. Counterbalanced rudder (75 percent/25 percent) nearly doubles effectiveness.



One-sixteenth-inch birch ply laminations trap EZ hinges on this simple, light, weed-free rudder. Plans for six sizes are available.



One-sixteenth-inch balsa trough forms mold for laminated glass, carbon fiber and epoxy float gear. Note card-stock pattern for glass-cloth layers in foreground.



Balsa gear mold with laminations complete. Breakaway mold after curing. (See text for lay-up instructions.)

to become airborne before it has attained sufficient flying speed.

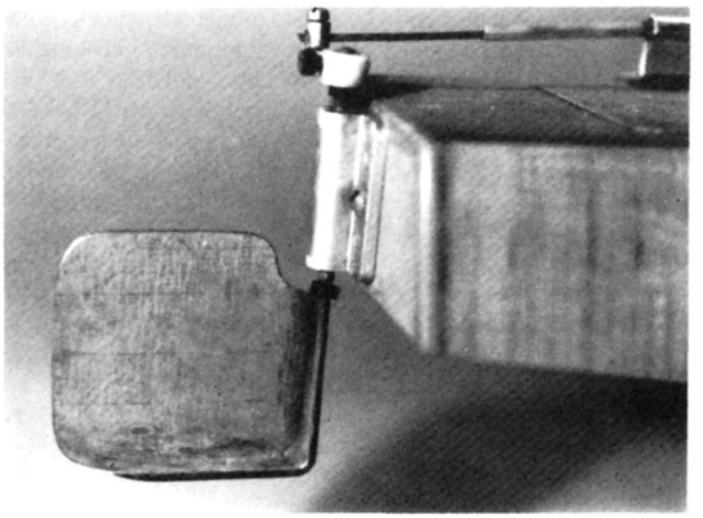
2) Floats should be long enough (approximately 80 percent of the fuselage length calculated from prop washer to rudder-hinge line) to allow a 2-inch minimum extension of the float bow in front of the prop disc with the float step positioned directly under, or slightly behind, the plane's center of gravity. This will minimize bow tipping and spray blister, while maintaining optimum step location for planing.

3) The bottom of the prop arc should clear the float decks by 2 inches on all floatplanes. The 2-inch rise works well on .20 planes; it also works on larger sizes, because the floats are proportionately larger, thus elevating the prop arc.

4) Allow a spread between the floats of approximately 25 percent of the wingspan on normal-aspect-ratio wings (5½ to 1). You can also use the following spreads to get you in the ballpark: .15/.20 - 11½ inches; .30/.40 - 12½ inches; .50/.60 - 13½ inches; .60/.80 - 14½ inches; .90/1.2 - 15½ inches; 1.2 and up - 16½ inches.

I've learned that floatplanes can tolerate misalignment quite well, but it's still important to *begin* with a correctly aligned setup. Get out some books and blocks (and whatever else you can lay your hands on), and block up the floats and fuselage over parallel lines that have been drawn on your work table or a big sheet of paper. Tape or weight everything down so that it won't budge. This way, it's almost impossible to make a mistake with alignment, and you can proceed confidently with your gear fabrication and installation.

Now it's time to consider the four different gear types and see how they measure up. The first option is commercially available composite or aluminum gear blanks, which are set up for wheels and require an aluminum T-section (available at hardware stores) to mount onto the float decks. The T-sections allow staggered positioning of the hold-down screws to the float decks, and this combats side loading. Spreaders can be easily installed using music wire and wheel collars, and if you use two screws at the juncture of each leg and the fuselage, the width of the gear material used takes care of shear forces without the use of an N-strut. Commercial gear provide "narrowest limit" spread for float applications, and they're really ideal for a first float venture. Their only disadvantages are that one of the pairs will probably have to be blocked out, or let in to the fuselage to attain the correct attitude, and since they aren't splayed, their appearance doesn't lend itself well to scale and semi-scale applications.

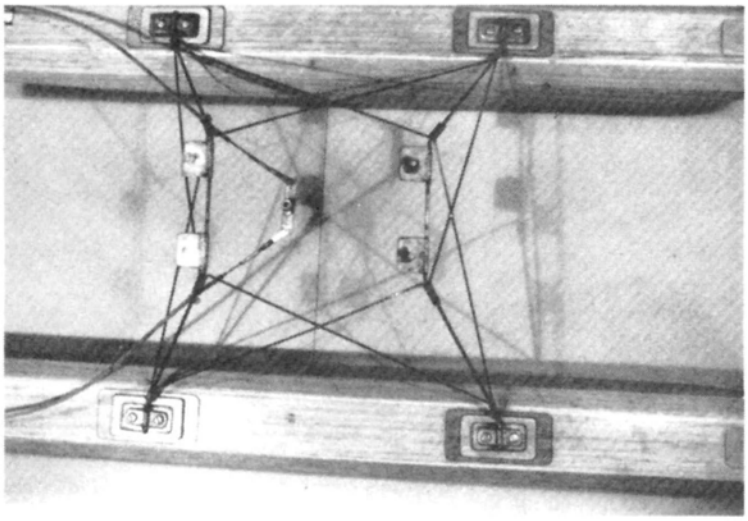


Nylon nose-gear bearing block and tiller arm combine with music-wire post and sheet-metal rudder. Off-the-shelf items speed up building time.

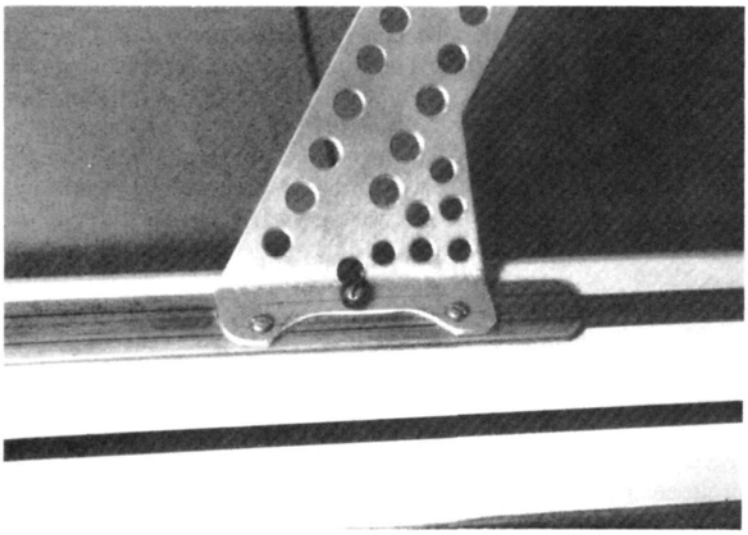
Music-wire gear, especially when done with strut covers, comes very close to scale appearance; it's also extremely *maddening* to work with. In an effort to simplify this process (and the two that follow), see the full-size plan (No. 10893) for wire, aluminum and composite float-gear blanks in the six most common sizes, along with rudder patterns. The plan features gear that are splayed, or spread forward and aft to more closely approximate the appearance of full-scale float gear.

Back to wire gear. If you've taken the time to block up the floats and fuselage, let me tell you something that will save you a lot of time *and* frustration. Straighten out some coat hangers; then bend the hanger wire to shape with pliers *before* attacking the music wire with a vise and a hammer. Actually, music wire really isn't *that* hard, once you familiarize yourself with how much over-bending is enough.

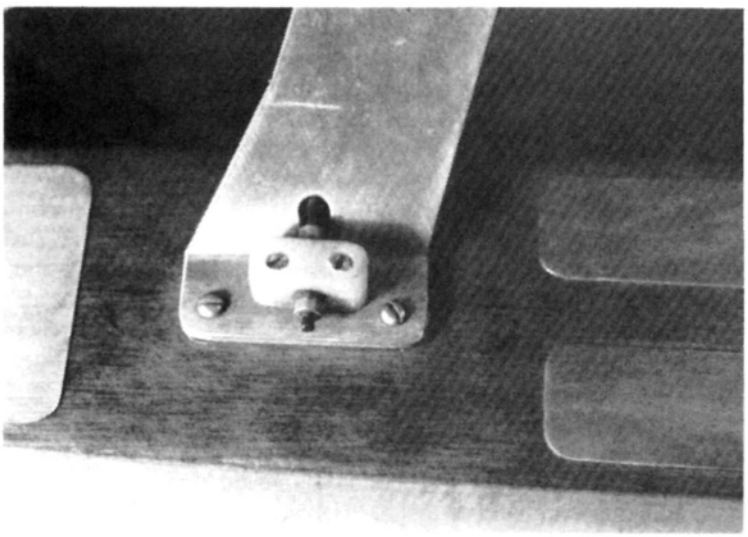
Music-wire gear comply with all our criteria if you install N-struts and spreaders or triangulated braces. (Check the photo to see how nuts you can get. The example shown is used on a 56-inch old-timer that weighs 4½ pounds with 32-inch



Top view of music-wire float gear. Note soldered sheet-metal deck and fuselage mounting tabs. (See text for recommended wire sizes.)



Aluminum gear is drilled to save weight. Note staggered mounting screws and spreader bar/hold-down screw location.



In this application, nylon block carries music-wire spreader bar with staggered hold-downs.

floats, and it has proven to be perfect for the application.) Music wire is the second most flexible of the four types, and a little flexibility isn't a bad feature, as it helps to absorb shocks and actually facilitates the float's progress through rough water. (An example of this phenomenon can be found in full-scale racing trimarans.)

Designers of these craft have found that the outboard floats, or amas, present less resistance if allowed to travel *over* waves, to some extent, rather than crashing through them. This flexibility has never been tried on full-scale floatplanes, and it probably won't be because of the attendant complexity; but if it works for us and saves weight, let's use it!

The recommended sizes for mains and auxiliary members on model floatplanes are as follows: .15, .20, .30 and .40 sizes (28- and 32-inch floats) - 3/32-inch mains with 1/16-inch auxiliary; .50, .60 and .80 sizes (36- and 40-inch floats) - 1/8-inch mains with 3/32-inch auxiliary; .90, 1.2 and up (44- and 48-inch floats) - 5/32-inch mains with 1/8-inch auxiliary. Always sand and wrap wire pairs before soldering, and be sure to let your heat build up. Also wire the joints clean with a solder-paste impregnated brush before they cool. You'll be rewarded with a tough, shiny job, and your effort will be pay off in appearance and service.

When scratch-built from the plan patterns and used in conjunction with music-wire spreader bars, the custom aluminum gear blanks meet all force, weight and flexibility criteria. Their appearance straddles the gap between model and full scale and, when drilled out with lightning holes, they look pretty sexy. The aluminum stock to use is the gauge that comes closest to 3/32 inch; it can be either mild or T6 grade aluminum. (As an aside, I've found an almost inexhaustible supply of T6 aluminum: I buy slightly damaged road signs at scrap prices from the city corporation yard. Most of the signs have a couple bullet holes or bent corners, but it's easy to work around the damaged areas and belt-sand the painted surface off.)

To fabricate the gear, you'll need to use a band saw for cutting and a vise with jaws large enough to clear the opposing leg when bending. To avoid tearing or fatigue at the bends, be sure to use wooden blocks with eased edges in the vise jaws. Aluminum tends to stick and load up on band-saw blades and files, but the smooth patina on the finished piece is worth the hassle. The gear-leg width shown on the plans serves primarily to accommodate shear forces, and the legs can be substantially drilled out without affecting the rigidity needed to handle spread loads. Don't forget to stagger the mounting screws at the float decks to eliminate side-load twisting. The fabricated aluminum gear has been my choice on two of the four floatplanes I fly, because there's less bending involved, no soldering required, and their service has been excellent.

There are times at the end of a project, however, when I just can't face another hassle like bending music wire or aluminum. Making my own composite gear has proven to be a pleasant alternative, and I offer it as a fourth choice for float gear. I first used this method on a scale model of a Druine Turbulent. The Turbulent's

fuselage has a V-shaped underbody with rocker conforming to the airfoil bottom. I didn't like the thought of having to bend that "V" into the gear base and calculating the forward and rearward sweep of the gear while landing flat and true on the float decks.

The first step in this build-up process involves blocking up the fuselage and floats as described earlier. After everything has been trued and held down, use the gear patterns as a guide to fabricate the two gear blanks, in place, using 1/16-inch balsa sheets tacked together with CA. This balsa gear blank will become the bottom of your composite gear mold. After bracing the balsa gear from beneath with scrap balsa sticks, carefully lift off the fuselage, glue the balsa blanks to a work surface, then add more bracing. Next, line the perimeter of the two blanks with balsa strip to create a continuous trough with 1/4-inch-high sides.

After painting three to four heavy coats of mold release or car wax in the trough area, you're ready to lay up your composite gear. Make a pattern of the gear trough from light card stock, and trace the pattern on 6-ounce fiberglass cloth with an indelible marker; make six pieces of cloth for each gear blank. In addition to the glass-cloth, the composite gear uses carbon-fiber ribbon strips, which extend 1 1/2 inches past each bend, so at this time, you'll also cut enough pieces (two at each bend for the three larger gear blanks, and one at each bend for the smaller three).

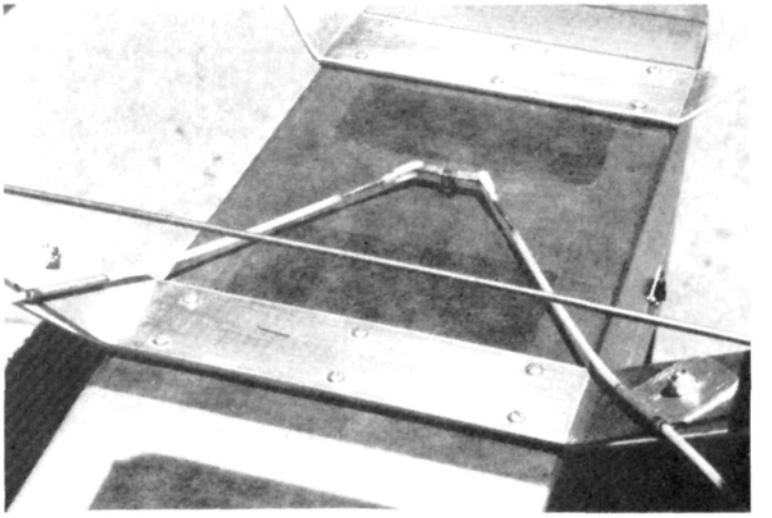
If you've exercised a little care up to this point, the lay-up process should be fun. Using a finishing epoxy resin with a 30-minute hardener (polyester becomes brittle with age), paint the inside of the gear-blank trough. Lay in the first piece of cloth, and wet it out by smoothing it down with a narrow spatula.

Lay in a second piece of cloth, wet it out *judiciously* and smooth with the spatula. With the first two glass layers in the mold, it's time to lay in the first lamination of carbon-fiber strips. The carbon fiber frays and unravels, so have your strips laid out neatly, away from the work area. Pick them up by sliding a knife underneath the cut strips, drop them into place, and push them into the wet cloth with your spatula.

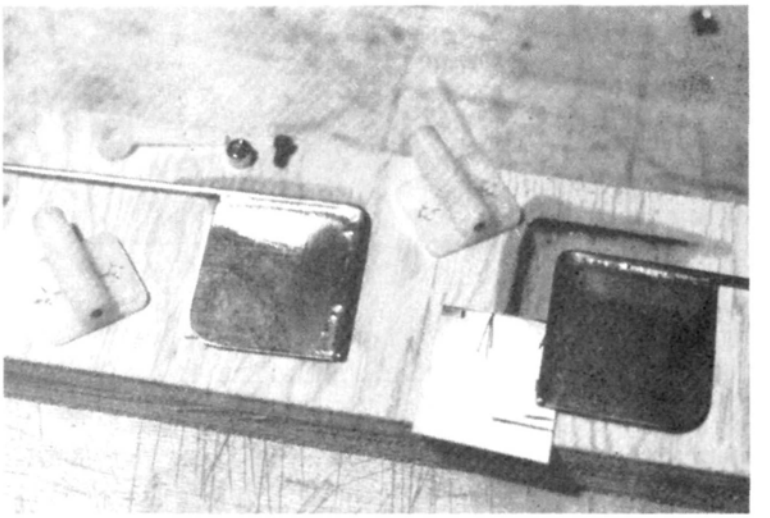
By now, you've done everything you need to do—once. The rest of the procedure involves laying in two more glass strips, one more carbon-fiber lamination, and two final glass strips. The whole lay-up (two glass, one fiber, two glass, one fiber, and two glass) will result in a gear blank approximately 1/8-inch thick that's lighter than any of the other types discussed here, more flexible and tough as nails!

After the lay-up has cured for 24 hours, break off the balsa mold, sand the gear smooth and paint. Built-up gear should be mounted with screws and fiber washers, which prevent splitting around the screw heads. I've used Dave Brown* carbon-fiber tape and West System Finishing Epoxy with consistently good results.

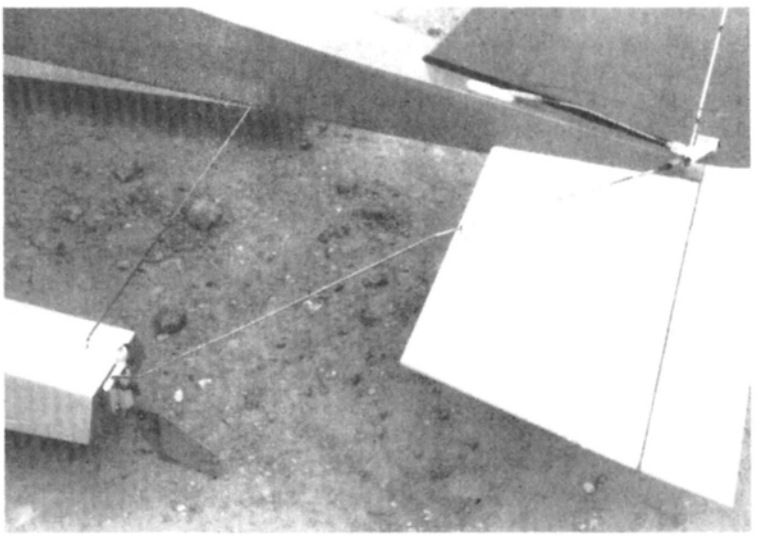
Trying to operate a floatplane without an effective rudder system is tantamount to inviting certain failure. In all but absolutely calm conditions, a submerged rudder is just as important on the water as aileron, rudder and elevator control is in the air. Not that I don't sym-



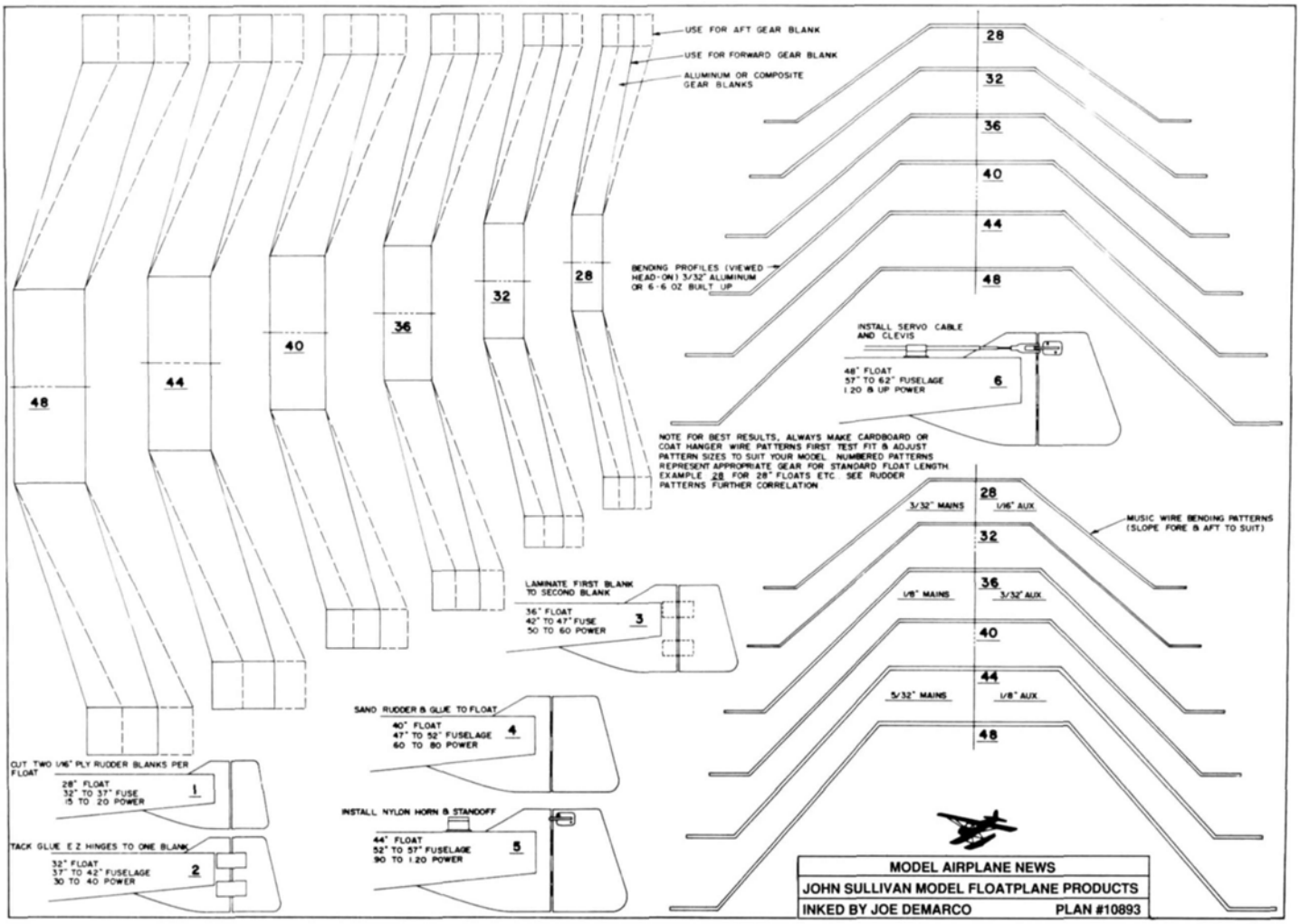
Six 1/2-inch sheet-metal screws on each leg provide sufficient shear on this .90-size floatplane. Clamps made of aluminum flashing serve as cable control guides.



Sheet metal, music wire and nose-gear components ready for final assembly.



Whatever works! Bent music wire operates left water rudder directly from air-rudder control horn. Right rudder is slave-operated from left rudder.



pathize with the first-time float flier who says, "Jeez, I just built two floats and special gear and now I have to make rudders too?!" Over the years, we've featured various types of rudder systems built, by and large, using off-the-shelf hobby hardware. The generic rudder system of this type utilizes a standard nose-wheel bracket and a control arm with a piece of heavy music wire for the rudder shaft and a sheet-metal rudder soldered to the shaft. Recently, I found a laminated rudder system that can be fabricated and mounted on the floats, ready to paint, in less than two hours. This has the added advantage of being weed-free without the complexity of a kick-up system. (For a look at this revolutionary rudder system, see photo.) Although the rudder type isn't scale, it does have two advantages that are peculiar to modeling in addition to the weed-free capability: The outline of the laminated rudder system can be altered to mimic the outline of your model's air rudder (which seems to lend it some aesthetic credence), and the water rudder can be designed large enough to provide yaw stabilization, which is often essential on floatplanes.

The rudder system shown on the plans in six sizes is simply two pieces of $^{1}/_{16}$-inch birch plywood laminated together with Sig* or EZ* hinges between the glued halves. The stationary portion of the rudder is cut out to fit over, and glue to, the float stern section, and a nylon control horn is glued or screwed to the movable section for control actuation.

Short of waterproofing and cable hookups, that's all there is to it! The outline design of the rudder shown on the plans is only offered as a starting point; if you don't like the look of it, feel free to change it. If you *do* make changes, ensure adequate control response by keeping the area of the bottom half of the movable section within the following limits: .15 to .20 size (28-inch float) - 1.25 square inches; .30 to .40 size (32-inch float) - 2.25 square inches; .50 to .60 size (36-inch float) - 3.25 square inches; .60 to .90 size (40- to 44-inch float) - 4 square inches; and 1.2 and up (48-inch float) - 4.5 square inches.

At the beginning, I admitted that float flying is especially complicated, but I neglected to mention that it's also a lot more fun than other types of flying. Every year, several thousand new float fliers are introduced to the sport. I have a special vantage point because of my involvement with "Floating Around" and my float-manufacturing business*. After four years of this, no one has ever got back to me to say that float flying was a bum trip. I encourage those of you with questions to contact me; I'll be as helpful as possible. If you've been successful, spread the word. Float flying is just too much of a blast to be kept a secret!

**Here are the addresses of the companies mentioned in this article:*
***Dave Brown Products,** 4560 Layhigh Rd., Hamilton, OH 45013.*
West System Epoxy
***Sig Manufacturing Co.,** 401 South Front St., Montezuma, IA 50171.*
***EZ Hinges;** distributed by Global Hobby Distributors, 10725 Ellis Ave., Fountain Valley, CA 92728.*
***John Sullivan Float Products,** 1421 Second St., Calistoga, CA 94515.* ■

Floating Around

by JOHN SULLIVAN

SOMETIMES A MODELING project of such significance comes along that it demands acknowledgment. In the area of seaplanes, we've been fortunate to see two such projects come to fruition this year: the eight-engine Spruce Goose described in this issue's Clearlake report, and a Convair Sea Dart that's designed and built by James Gilgenbach of Fon Du Lac, WI.

The full-scale Dart was first ordered by the Navy to address its need for a high-performance waterborne fighter. Convair was selected to develop the swept-wing fighter, and it developed and flew five of them between 1948 and 1956 before a shortage of funds necessitated that the project be shelved. The full-scale Dart had its problems, including directional instability on the water, pounding and vibration, and excessive takeoff distance among them, but it has never failed to inspire anyone who has seen a picture of this machine-made manta ray blasting through the waves.

James Gilgenbach was similarly inspired, but unlike many other modelers, he decided to *do* something about it. Never mind that he had no experience with seaplanes *or* ducted fans; he did it anyway! James admits that he had much help along the way from Tom Cook of Jet Model Products and George Sparr of Aerospace Composite Products, but the final bow must be taken by James for putting this incredible project together.

Above: Mike Kline of Grandville, MI, with his original-design Maverick on Sullivan floats. Picture was taken 10 steps outside Mike's office door! How does he work?

Left: Unidentified retriever brings back the pieces. Is this a new concept in floatplanes? Omas site, southwest of Portland, OR.

The Dart gets its motivation from an O.S. 77-powered Dynamax fan unit housed in dual inlet and outlet tubes going to a single internal chamber. The model is built entirely of composite materials and balsa for lightness and strength and to ensure a scale speed of more than 100mph. The entire thrust-tube assembly weighs a mere 2.6 ounces, and James threw out and rebuilt many components as he went along when he realized they could be built lighter. The result for this 1/9-scale project with detachable wings and operating skis is a 10-pound seaplane with a very respectable 22 1/2-ounce overall wing loading.

The Sea Dart has wheels mounted in the trailing edge of its water skis and another in the water rudder/ventral fin, which allows marginal takeoff performance on grass fields in addition to the plane's waterborne capabilities. The 0.S. 77 is fed by three fuel tanks providing a total capacity of 24 ounces, and they're grouped around the CG to avoid weight changes during flight but still give less than 12 minutes flying time at full throttle! Guidance is provided by a Futaba Conquest PCM.

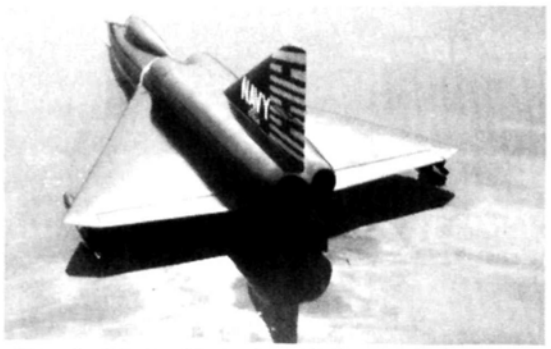
The only deviation from scale is the addition of wing-tip rockets, which actually serve as tip floats to improve water handling. Attention to detail is evident everywhere: The outer tubes of the rear ski struts are Kevlar, while the inners are aluminum, and the skis themselves are hollow with an opening at the stern that allows them to sink when the Dart is at rest on the water. As I write, the Sea Dart has completed high-speed taxi tests, but it has yet to fly from water. With the per-

Steve Milos retrieves his latest Warbird on floats: a 7 1/2-pound, .90-powered Curtiss Seahawk.

sistence James has shown so far, however, success is sure to be just around the corner.

Reinforcement Update

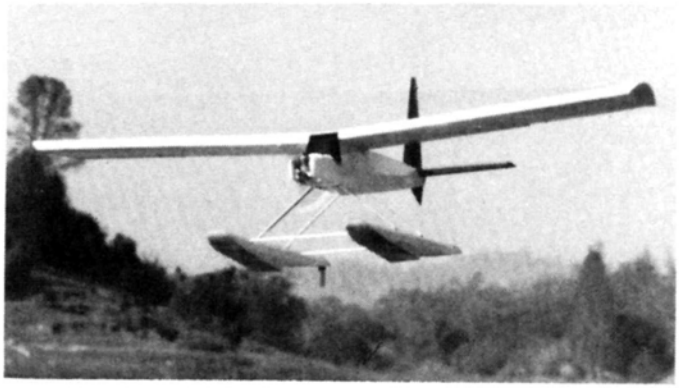
Actually, this "update" has been lying on my desk far too long. The gist of it is that the best place to develop strength in a pair of floats is on the sides of the floats, fore and aft of the juncture of the step wall and the rear cutaway aft underbody. This is at the bottom center area of the float, and our pontoons seem to be breaking, or developing hairline cracks, because this section of the float transfers loads to the gear legs, which are always positioned ahead of, and behind, that point. Experience has shown that no amount of reinforcement (and the attendant weight) at deck level and down to the step area (extra bulkheads, bracing, etc.) will do the job as well, and as lightly, as laminated reinforcement on the side step area. In most cases, an extra strip of glass-cloth or a piece of 1/64-inch plywood (around 40 percent of the total float length) glued down in that area will do the job. A little extra attention here will save you from hairline cracks on foam floats, or separated bulkheads or split sides on built-ups. On the floats, hardpoint areas for deck mounting and side sheeting or covering should be considered as "job-specific" components that work in harmony with all the other parts to get the job done.



Gilgenbach's Sea Dart at rest belies the furious performance of which it's capable.

Floating Rogues Gallery

I received a nice letter from Gary Dumond of Plaisted, ME, containing some pictures of his fleet of floatplanes. As shown, Gary flies a Unionville Hobbies Beaver on Sig floats, a Goldberg Cub on Goldberg floats and a Cessna 182 on EDOs. The Beaver is powered by a Super Tigre .90, while the Cub gets its go from a Super Tigre .45. Gary flies the Cub on skis in the winter (which, in Maine, extends from November to May), and he works for the Maine Warden Service, which offers professional flight instruction for singles, multis and helicopters on land and sea. I look at that beautiful lake and wonder if these people could use a carefully aged float columnist as an apprentice bush pilot.



Jerry Sleight's modified 8-foot Quaker, The Flying Pillow, drifts by, powered by an early O.S. .60 4-stroke with exposed rockers. Sullivan floats; Kraft radio.

I also received a great letter from Mike Cline of Grandville, MI, in which he raves about Sullivan Floats and all the help he's received from my column (stroke, stroke). Seriously, I'm grateful, because I've always felt that helping people have fun gets you points somewhere, and the circle keeps expanding. Mike's Maverick, which he designed and built from scratch, has a 49 1/2-inch span, weighs 3 1/2 pounds with floats, and flies behind an O.S. 25 FSR. The floats are sheeted with 1/16-inch balsa covered with Top Flite's MonoKote, and set parallel to the stab. The airfoil is a modified flat-bottom with a Phillips entry, which gives good inverted performance with no problem snaps and rolls.

According to Mike, the Maverick proved itself at his area's first floatfly, where he won three of four events and took overall 1st place. He modestly says that the credit has to go to the floats and their superior handling, but *I* think that the *pilot* had a lot to do with it, too. With float flys popping up all over, there's a real need for a good contest floatplane. How about some plans, Mike?

Also this month, we have pictures of Steve Milos's new Sea Fury and a crash-boat scene from Ed Westwood in Spanaway, WA. Ed tells me that Milos has the habit of building outstanding floatplanes with superb flying characteristics from just a few lines on butcher paper. Ed has been running right behind Steve, preparing drawings after the fact, so here's another request, Ed: Send the Sea Fury plans to *Model Airplane News!*

Rounding out our gallery is a shot of Jerry Sleight's Flying Pillow, which is actually a modified planform of the Old Quaker. Jerry's idea was to modify an old design to improve it, rather than honoring (once again) the integrity of the original. This will probably never happen, but perhaps there should be a class like this in SAM activities to allow experimentation. Jerry's plane has a stationary rudder and flies on throttle, ailerons and elevator. It's easy to fly (one of the easiest I've ever tried) and "putts" around like a feather. Climbing is exceptional, and it seems as if that old O.S. swinging a large prop could run for half a day on a 4-ounce tank.

James Gilgenbach's Twin Fan Sea Dart hammers away on a takeoff run. (See text for specs on this impressive project.)

Hint for High Fliers

This column is the twenty-fourth "Floating Around"; at six times a year, that's four years. Thinking back to the outlines I submitted to Dan Santich for the first few columns, I recall having doubts that I could really write that much about float

(Continued on page 76)

FLOATING AROUND

(Continued from page 74)

flying; *now* I'm of the opinion that nobody could ever shut me up! Readers' contributions, comments and questions have been the lifeblood of this column, and I thank all who have contributed. A recent comment by Dave Lockatel of Santa Rosa, CA, is typical of many and concerns that "dreaded" first flight on floats.

Dave had reached the "roll-on-takeoff" level of flight proficiency when he decided to try float flying and traveled to a float fly in the foothills above Sacramento in Northern California. He arrived a day early, rented a cabin on the edge of the

Some guys have it all! Gary Dumond of the Maine Warden Service flies an 8-foot Beaver, a Goldberg Cub and a Cessna 182—all on floats!

lake, and remembers standing there at dusk, looking over the water and wondering what in the world he had got himself into. He either spent a sleepless night or woke up 50 times (his memory blurs here), and the next day, he eventually presented himself at the flight line shaking like a Chihuahua in a snowstorm.

Dave somehow managed to steer his Cub out to the takeoff line and pushed the throttle full ahead. Nothing bad happened; in fact, the Cub went straight ahead, took off, and exhibited flight characteristics that were better than anything experienced with the same plane on wheels! Dave said that this was one of the few times when he wished he could turn back the clock 24 hours and use what he had just learned to eliminate all the grief that came from trying the unknown.

That's the message I'd like to pass on to those of you who are considering your first float experience: It's easy; it's a heck of a lot of fun; and it just might be your hobby of choice for the rest of your life. See you next month. ■

A C E

FLOAT FLY '89

PHOTOS BY RED COSTLOW

This annual event brings new meaning to the theme, "Ace is the place...!"

Paul Holsten of Ace R/C and Gary Meissner performed many of the retrieving chores.

by RED COSTLOW

EVER SINCE THE first manned flight, people have gathered to watch takeoffs and landings. On June 3 and 4 this year, several thousand people had their fill of such excitement when they attended the 2nd Annual Float Fly in Higginsville, MO. It was sponsored by Ace Radio, and it almost *didn't* happen. On Friday, the National Weather Service in Kansas City gave a dire forecast for the weekend weather. A severe storm was headed toward the area, and people were warned about the possibility of thunderstorms, hailstorms and perhaps even a tornado.

On Friday, tours were conducted through the Ace buildings, and many took their chance to see all the functions of Ace in its very new, very modern facility. On Friday night, about 130 pilots showed up at Willis & Jean's Restaurant in Higginsville to have their transmitters processed. They had all looked forward to this gathering, because it gave them a chance to swap "war stories." Over 180 modelers had pre-registered, so everything went smoothly as packets were handed

Tom Runge and "Doc" Matthews were discussing some of Doc's upcoming designs.

Doc Matthews' O.S. 120-powered Flying Machine just about to lift off.

out and Steve Gooseman and George Schwarzer checked transmitters on the spectrum analyzer and frequency counter. Many modelers were meeting old friends, and a good time was had by all.

In the wee hours of the morning, the heavens opened and threw down a couple of inches of rain, but it was even more threatening on Saturday morning with winds of up to 10mph—but still no rain. Everything was ready at the Higginsville Lake, which is just a couple of miles east of town, where the headquarters tent was set up and a pilots' meeting was held from 8 to 8:30. Then the flying began.

Noting the darkening sky, most pilots wanted to get into the air quickly. There were six pilot stations along the shore, each identified with hula hoops and a banner, so that when a pilot's name was called and he was assigned to a particular station, it could be easily located. Some way from the pilot stations, bleachers had been set up for spectators, and a large area was reserved for those who wanted to put up tents, umbrellas, etc. A hobby shop was set up in the area where modelers could get supplies and make repairs. Several pilots were seen doing minor patching jobs and getting the necessary props and fuel. Jim Van Loo, president of IMAA, was the announcer for the weekend, and he did an outstanding job of keeping the spectators apprised of what was going on while subtly teasing the pilots—especially the most well-known ones.

Ace employees had built two little electric-powered retriever boats that were somewhat like catamarans, and they called them Miami Mice I and II. In addition,

Presently in the kit-planning stage is another design from the prolific Doc Matthews; this one is the Bandito 40.

Mr. Sunday Flier, Ken Willard on the sticks.

Some of the float-fly spectators. The guy in the middle obviously has the best vantage point.

Paul Holsten had his bass boat there to make retrievals farther out on the lake. This worked very well, but flying was slightly hampered, because, for safety reasons, pilots weren't permitted to take off or land while the boats were out on the lake. But safety was ensured and there were very few accidents. Most of the failures were due to ground-looping (or water-looping?) by planes that caught a wing tip because of a little gust of wind. We had a real kick watching Ken Willard fly one of the many Seamasters; his touch-and go-landings were a joy to watch.

R/C Video Magazine was there to tape the action for an upcoming cassette, as was Thomas Maufort of M&E Video Productions from Green Bay, WI, who taped the entire float fly for a video cassette that will eventually be available from Ace R/C.

At Saturday night's excellent buffet, Tom and Donna Runge gave a talk, and then Geof Stiles of the Academy of Model Aeronautics told us about the current status of the AMA. Ken Willard sprinkled his talk with some rather ribald jokes (jokes he claims were told to him), and the evening ended with a sing-along.

By Sunday morning, the winds had calmed somewhat, but the weather still looked bad. Pilots were back in the air promptly at 8 o'clock, and they flew throughout the day. Brian Bumgarner, manager of the Higginsville airport, gave me a lift in his Citabria so that I could take some aerial shots. Just on the other side of the lake, Brian did some aerobatics with his Christen Eagle for the enjoyment of the spectators. Especially exciting was his knife-edge flight; of course, immediately afterward, other modelers tried to follow suit.

Bird's-eye view of the site taken from a Citabria.

There was no shortage of Ace products at the gathering. Here's one of Ace's 4-120 bipes fitted with a radial-type cowl.

When Brian isn't teaching or flying, he runs B&D Restorations, spending most of his time restoring AT6s.

Higginsville (population: slightly less than 5,000) had banners in its store windows that said "Welcome Float Flyers." Doc Mathews came over from Wichita with his Flying Machine (120-4-stroke) and his Bandito (40-2-stroke). The foam floats on the Flying Machine were wrapped with strapping tape—unique! In addition to all the Seamasters, there was a very large troop of Doc Mathews' Stroker Squadron, as kitted by Ace, which also had its new prototypes of the Seamaster 120—a very large amphibian. There was an excellent selection of airplanes of all types: large and small amphibians and floatplanes. One of the prettiest, of course, is the Piper Cub on floats; it's almost as though this airplane was designed to be a floatplane. John Riggs had a Goldberg Cub on floats powered by a Saito 45; it's a good-looking machine, and it sounded very realistic. (John is an accomplished builder and pilot.) Bud Atkinson's 4-120 Bipe, dressed up in Army Air Force colors, drew "oohs" and "aahs" from the spectators.

Although I've been a modeler for over 50 years, this is probably the most professionally run model airplane meet that I've ever seen. Nothing was left to chance, and I'm sure that there will be just as many pilots (perhaps even more) at next year's event. Tom and Donna Runge, the employees of Ace Radio and members of the Mid Missouri Modelers all deserve a tremendous hand for an outstanding job!■

The "Miami Mice" retrieval boats were used throughout the meet.

Tom and Donna Runge, along with an efficient staff, made the second annual event move along without a hitch.

BEAVER

(Continued from page 25)

a good idea to measure the hole-to-hole distance while the wing is being installed in case your fittings are slightly different. When that has been done, cut the 1/2-inch aluminum streamlining tubing to length, and stuff tufts of cotton into each end. Drill some small holes in the ends and JB-weld the threaded rods into place. Bevel the 5/8-inch streamlining tubing end covers to match the wing and fuselage strut angles, and slide them over the struts. Check the fitting's end widths to ensure that the strut covers will slide over them (file them, if necessary).

2. Float struts: Each float down-strut is separate (not the ideal configuration, but since the struts exit the fuselage above the bottom, it was the only way I could make it look right). There are four of them on each side, and the plans show the sizes. Bend the top angles first, then slide the 3/16-inch aluminum streamlining tubing over them, along with the 1/4-inch, end-joint covers. (Do this before bending the bottom angles.) Block up the fuselage, slide all the struts into the appropriate holes, and lock them into place (after covering the fuselage, of course). To improve sag-resistance, the strut wires are joined at their lower ends. This is accomplished by bringing together the two strut bottoms and the 1/8-inch spreader with its 1/4-inch streamlining-tubing cover in place. Wrap the ends with copper wire and solder the three pieces together, capturing the spreader in the center.

The 1-square-inch float clips are made of 1x1 1/4x.032-inch brass stock. Make a "dummy" end stub that's identical to the one you just soldered together, and notch a hardwood block to accept both the end assembly and the brass clip. Put the dummy assembly over the clip and put them both over the notch in the block. Now hit it sharply with a hammer, or squeeze the whole works in a vise. This will form a "U" in the float clip. Make four of these clips. Put them all on their respective struts, which, in turn, are positioned over a horizontal surface marked like the float top. Solder them to the float struts by first tinning both the clips and the strut ends and "sweating" them together. Certainly there's an easier way to attach the floats, but this is a scale ship, and I devised this method to keep it close to scale. I didn't, however, put the spreaders through the floats themselves—one has to draw the line somewhere! I did this to keep the float itself simple and to offer an easy attachment if the floats have to be

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BEAVER

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changed.

The streamlined covers and their end sleeves are now expanded to their full lengths. The ladder steps are epoxied to the strut covers. (Make these out of 1/4-inch flanged Plaststruct, painted aluminum.)

3. Floats: This ship is light enough to handle 32-inch floats. In fact, the EDO 4960s scale out at about 32.5 inches. The Goldberg* 36-inch Cub floats, although heavy, are close to them. If you have access to a hot-wire setup, you can follow the drawings to make a couple of very satisfactory, scale-looking, V-bottom floats.

When preparing the cores, I first dado the 1 1/8x3/8x15-inch strong-back slots in the tops. I then cut two hard balsa or cedar strong-backs to match the slots. They're "Titebonded" into the slots and weighted down, inverted, over a wax-papered flat surface to ensure a flush surface. Then the step blocks and transom plates are installed, again using Titebond. Using either Sig Corebond or Dave Brown* Sorghum adhesive, the top 1/64-inch skins are rolled on and trimmed. The bottoms are glassed with 4-ounce cloth. I find it easier to cover the Vs with cloth than to try to fit the angled 1/64-inch bottom panels. The epoxy also seals the chine, and with a little sanding on the bottom, the float is ready for painting.

As for painting, I spray them first with Pactra* Prep; I sand; and then I spray them with Formula-U. To simulate the walkways, I bond 120-grit wet-or-dry sandpaper, cut to shape, to the top of the completed floats. A red danger stripe for the prop and a flat-black nose bumper are nice finishing touches.

• Water Rudders: 1/2A nose-wheel steering assemblies are used for the water-rudder supports. Cut off the coil-spring ends, and solder the rudder retaining clips onto the bottoms. Drill the clips for a 2-56 screw, shape and drill the rudders. Align them vertically, and attach the bases to the rear of the floats with No. 2, 1/4-inch sheet-metal screws.

Since the arms are actuated with only one line from the air rudder, a return device must be used to pull the rudder in the opposite direction. The plans show how to make return springs, but rubber bands stretched from a stand-off screw would work just as well. Tie the cable, which can be of any non-stretch material, to the air-rudder arm, then through the guides and pulleys around to the water-rudder arm. After straightening the rudder against the return-device tension, attach the cable to the water-rudder arm. When both lines have been attached, the return devices will work against each other, and the air-rudder shaft will have no tendency to turn by itself.

• Covering: To keep the weight down, I covered all flying surfaces with mica film. I covered the rear fuselage with MonoKote and painted the 1/64-inch sheeted front with matching Formula-U. I also painted the floats with Formula-U, but all the struts were left a natural aluminum.

The wing tips, tail fairings and cowling were also painted. Trim was a combination of spray-can yellow Formula-U and MonoKote trim. Flat black was used on the upper cowl and the float bottoms flat grey. (Rustoleum seems to work well here.) The door outlines, window frames and trim tabs were all done with Chart Pak 1/32-inch black tape. After painting and trimming, all surfaces were sealed with clear Formula-U, masked close to the trim so that the slight yellow tint wouldn't be too noticeable.

• Cowl: I formed the cowl and then turned it over to Northwest Hobby* since I'm not skilled with fiberglass. The cowl they sent back fit perfectly, and all I had to do was install upper and lower inside backing plates and drill them and the front fire wall to accept the No. 4, 1/2-inch Allen-head hidden attachment screws.

To ensure neatness, the locations of the engine opening and needle-valve hole were carefully calculated and measured before carving. I temporarily attached the unit to match the fuselage's paint lines, and I then removed it for painting. The lower oil-cooler intake was made with 3/16-inch sheet blocks (sanded and faired). A 2-inch piece of 5/16-inch brass tubing was JB-welded to the Saito* exhaust pipe to extend through the lower lobe of the cowling. It's marked approximately on the plans, but if another engine is used, some adjustment in hole position will be necessary.

FINAL ADJUSTMENTS: I found that my guess about servo and battery positions was right, and the CG came out at about 28 percent MAC, so no additional weight was necessary. The control throws are: elevator, 3/4 inch each way; rudder, 3/4 inch each way; ailerons, 1/2 inch up and 1/4 inch down; and flaps, 45 degrees down for full deployment.

The water rudders should be configured to move about 1/2 inch each way. The switch is on the left side, and the charge

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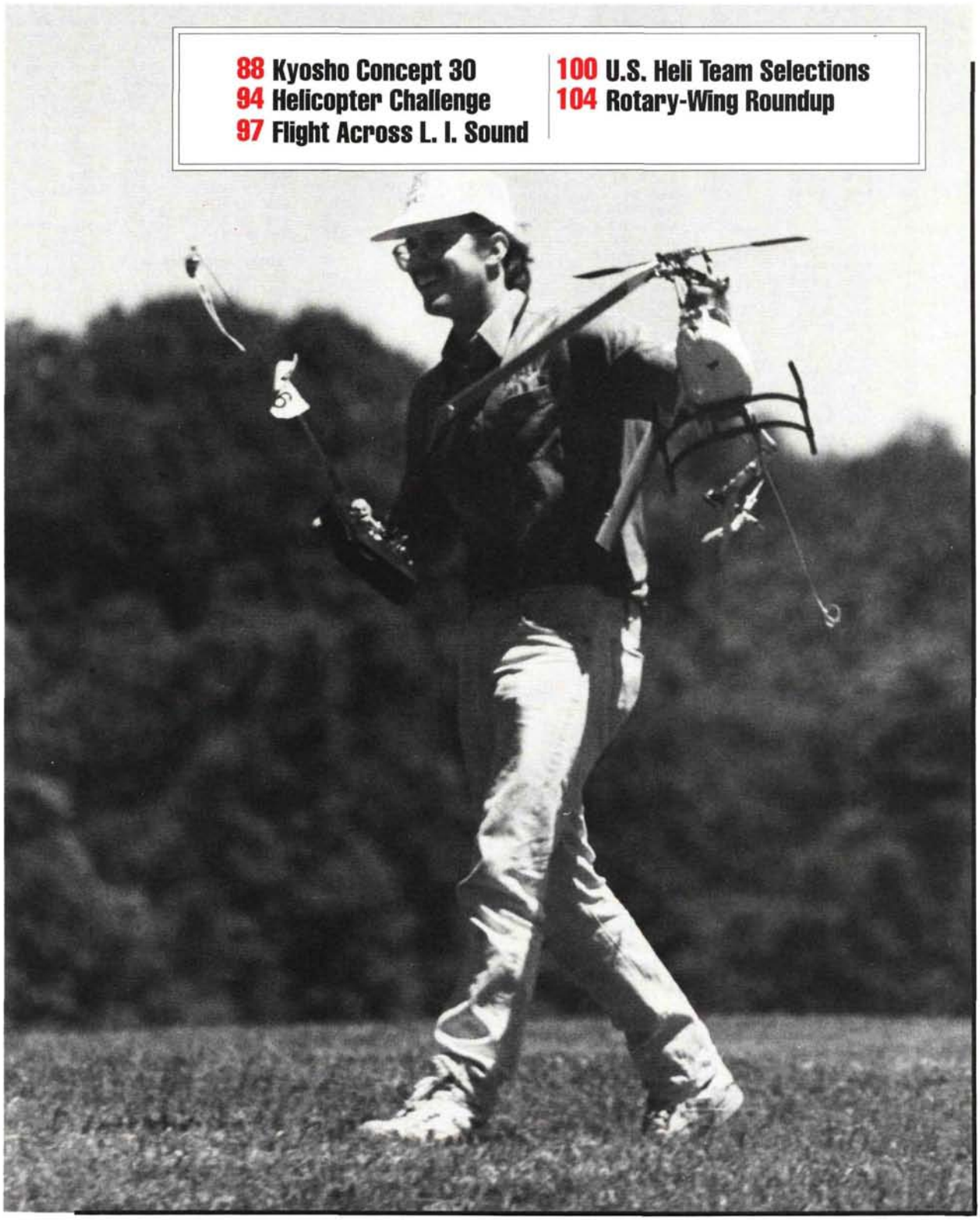
NEW MONTHLY

HELICOPTER SECTION



The "canopy" and windshield of the Concept are molded in durable plastic with the clear portion requiring only trimming prior to installation.

A LITTLE OVER A year ago (August '88), I did a "Field & Bench" review on the Sport 500 helicopter, which is imported from England by Hobby Lobby*. This was my introduction to the unique and challenging world of R/C helicopter flying. I recently reread that article to see if anything had changed my perspective on heli flying—anything except additional "advice" from the experts, attending a number of meets, and reading all the ads. Well, nothing really had—until now.

I still have that Sport 500 and it has served me well, for what it was. In that review, I mentioned that it was difficult to convince newcomers to heli flying that fixed-pitch (non-collective) machines were *that* much more difficult to fly than collective machines. At least, that *was* once true.

I'll be the first to admit that I still consider myself a beginner with helicopters (my flying buddies might expand this to include fixed-wing), so maybe I'm ideally qualified to assess whether something is easier or not. It can now be revealed: Collective-pitch-equipped machines *are* easier to fly, and they have a much broader performance envelope, which includes aerobatics.

Kyosho* (a name that should be familiar to anyone who has been involved in the hobby for more than a week) has added helicopters to its extensive line of cars, boats

KYOSHO

CONCEPT 30

by RICH URAVITCH

PHOTOS BY RICH URAVITCH

One of the new wave of down-sized, full-performance helis that are introducing R/Cers to the challenges of rotary-winged flying

and airplanes. Its newest offering, and the subject of this review, is the Concept 30.

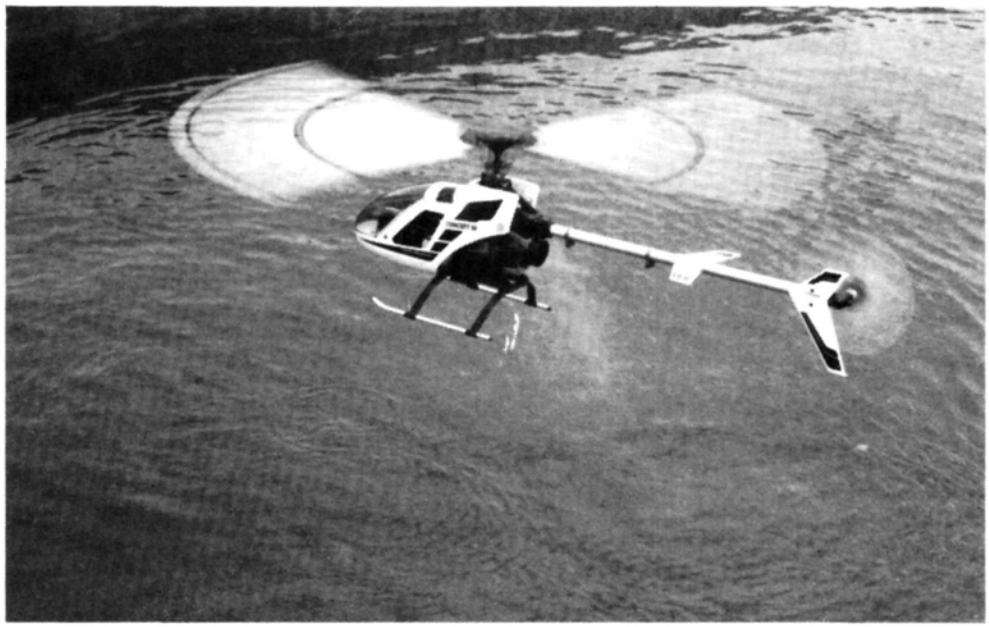
I approached this review with a great deal of enthusiasm, because I'd heard a great deal about the Concept from people who had already bought their kits and were just starting to fly them. Like me, some were novices, but nearly all the comments I heard were positive, so it wasn't hard to get excited about trying one. The kit is available in two configurations: the DX for the novice, and the SE for the advanced flier. Being the perennial optimist, I selected the SE version, figuring that I'd "grow into it." I am!

The DX version can easily be upgraded to the SE configuration by adding parts like full ball bearings and molded, composite, flybar paddles for increased control response. Unlike the SE, which is only available in kit form, the DX is available fully assembled (with or without engine), or as a kit. Whichever version you choose, I recommend that you buy it in kit form, because assembling it will give you a better understanding of how things work. You'll also *have to* become familiar with the assembly technique if (when?!) your fingers and the earth act in concert to "disassemble" your machine!!

THE KIT: Two manuals were included: The assembly manual takes you step-by-step through the build-up, adjusting, troubleshooting, tracking, trimming and, eventually, to flying the Concept. The final section contains exploded parts diagrams and a parts list that covers every component in the helicopter. The other manual is a 28-page supplement that covers the theory and operation of helicopters and provides understandable answers to often-asked questions. These are two of the most comprehensive books I've ever seen in *any* kit, *ever!* Actual assembly instructions are covered in 11 pages and, if the axiom that "one picture is worth a thousand words" is true, 22,000 words have been saved.

Radio installation is discussed in detail, and the manual even includes specific lengths for all the control rods and details of the required servo throws. Instructions are provided for the use of either four or five servos. I recommend that you use the five-servo approach with a "sport" heli radio, as it provides pitch trim and throttle-hold functions which, although not absolutely necessary, are desirable.

I installed a Futaba* Conquest FP-5NLH 5-channel radio and a companion FP-G154 gyro. This great radio, which ideal for a be-

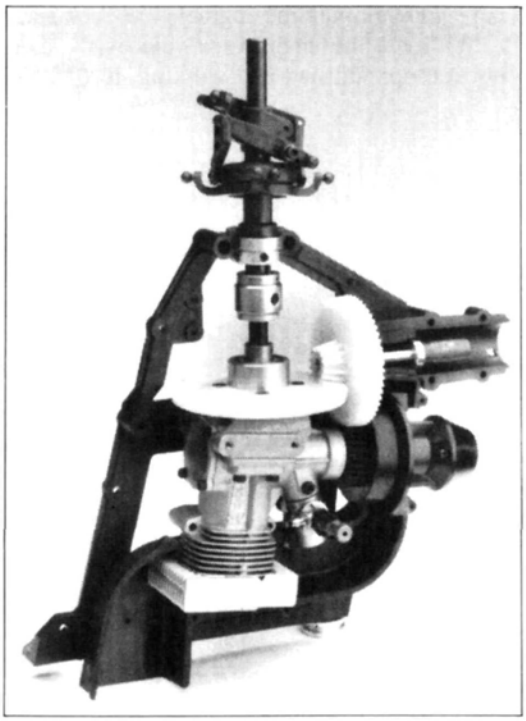


Since this is a seaplane issue, we thought it fitting that we show the Concept hovering over water. Nick Jr. was the intrepid pilot who chose not to use pontoons!

ginner, retains the quality of the Futaba line and provides the more important features that tailor it for heli use. The only shortcoming I found (later) is that it's supplied with a standard 500mAh battery pack, which will safely give you about three tanks of running before recharging is required. Remember, in addition to all five servos working most of the time, a gyro is also being powered, and this drains the battery much more rapidly than we fixed-wing fliers are used to. Remedies include replacing the pack with a higher-capacity unit of 800 to1200mAh, taking some sort of quick-charger to the field, or taking an additional, fully charged standard pack along. Practicing the hover consumes fuel and battery power, and it's easy to lose track of the time, because the heli isn't "doing something." This is only apparent to the transitioning fixed-wing flier; those who *start* with helis might not have that reference point.

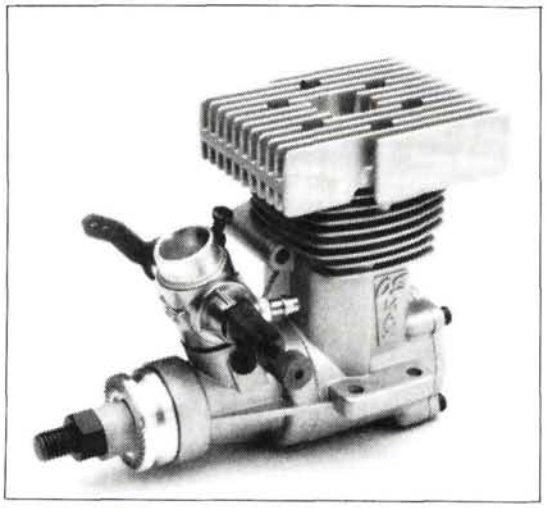
ASSEMBLY: Actual assembly time for the Concept was about 12 hours, which didn't include the time spent (about three evenings) reviewing the manuals, looking at the parts, and mentally preparing the sub-assemblies. The fit of all the parts really is exceptionally good. This might be the way of things for *all* R/C helis, and if it is, you heli fliers sure are spoiled!

I followed the instructions to the letter and experienced only one difficulty: I didn't install the aft inboard screw on the tail-rotor servo because the screws go in from the bottom and the path was blocked by framework and the fuel tank. Other than that, assembly went well; just be sure you select the correct hardware. Although Kyosho thoughtfully provides a drawing of the hardware required for each step, it's easy to grab an M3x15 screw when an M3x18 is called for. "Some disassembly may be required" later! When connecting the many ball links, the instructions *explicitly* tell you how to position the link on the ball, i.e. with the name Kyosho facing in a particular direction. *Don't ignore this!* Apparently, the ball receptacles are molded in such a way that they're easily (read unexpectedly) released if incorrectly installed. For the same reason, don't lubricate any parts unless told to do so. Some linkages may feel stiff, but let them wear in, rather than polishing the balls or adding grease.



This is the "heart" of the Concept. Note the downward angle of the engine, which enables the use of conventional starters. Molded cooling duct is contoured to match engine.

After installing the O.S.* 32H in the frame and adding the stock muf-



Right out of the box, the O.S. .32F-H ran great and provided plenty of power for the Concept. Note increased cooling-fin area now typical of heli engines.

fler, I discovered something that I thought might prove to be a problem later on: The idle mixture-adjustment screw couldn't be reached without removing the muffler. Remembering the words of more accomplished heli fliers about how important idle and transition are to helis, I borrowed a Hirobo* Shuttle muffler. The volume seemed larger, but more important, it left the mixture screw totally accessible. In retrospect, it might have been unnecessary, since I haven't had to alter the mixture screw's factory setting, and close to 3 gallons of fuel have gone through the engine!

With all the mechanical pieces hooked up, adjusted and working, it was time to deal with the cosmetics. All of the Concepts I'd seen had been white, which isn't unexpected, since that's the color in which the body (advanced heli guys call it "the canopy") is molded. I wanted *my* Concept to look a little different from the others, but I didn't want to add a new body as Nick Ziroli Jr. had done for last month's issue. So after wiping down the material with Prep-Sol (available from auto-paint supply stores), I sprayed two light coats of Hi-Visibility Orange right out of the Krylon can, and applied the kit-supplied trim markings. This was followed by two light coats of Hobby Poxy* gloss clear, which sealed everything. This all seems to be holding up well, so far. I saw some examples of nicely painted Concept bodies at the Toledo show, so if any of you have successfully developed a technique that provides a durable finish, let me know, so I can tell others.

PERFORMANCE: For the first flights, I brought all my standard support equipment and a set of "training sticks" to the field. It was decided, mostly by common sense, that we'd first fly the Concept for photographs and trimming, and then I'd give it a shot.

We turned on the radio and gyro and checked the controls once again for proper operation; everything was fine, but the gyro required reversing, and this was easily accomplished at the switch. Starting the O.S. was easy because of its installation configuration, which angles the engine slightly downward, so enabling a standard starter to engage the cone.

Because the glow plug isn't as ac-

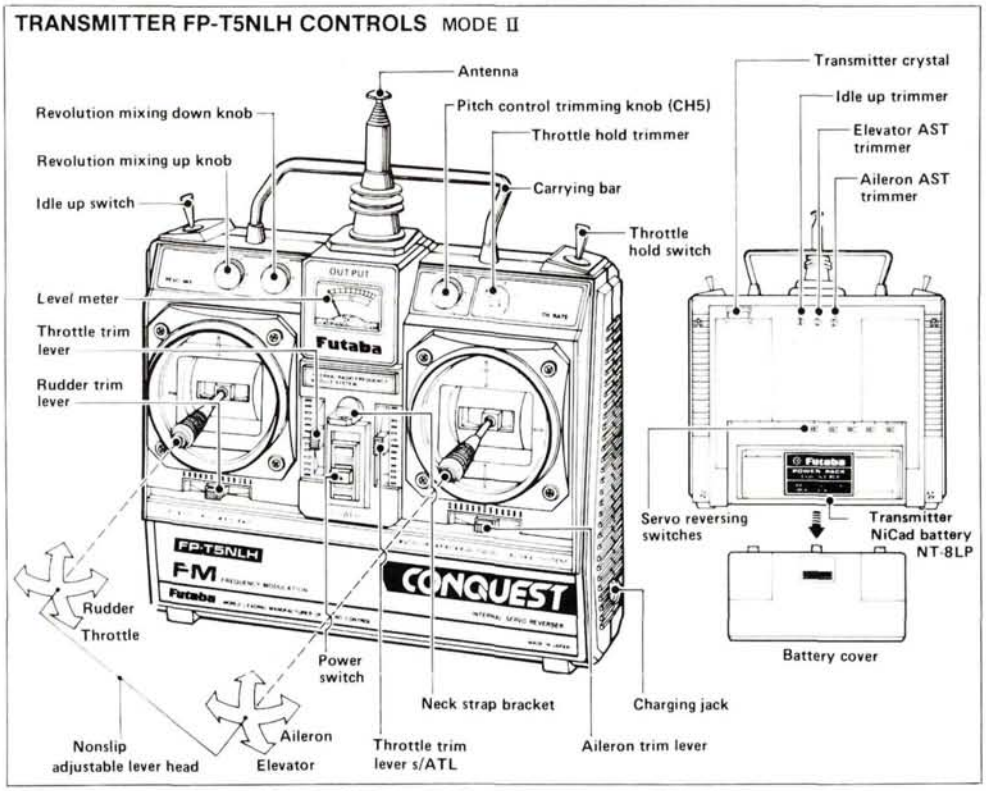
Part of the "upgrade" package to convert the DX to the SE is in the form of this ball-bearing package, which replaces standard bushings.

The clutch assembly has been redesigned from its original configuration for improved performance.

cessible, Kyosho supplies a deep wrench that's long enough to reach the engine, which is enclosed by a molded cooling duct. Some self-contained Ni-Cd ignition batteries might require that you hold the Concept off the ground to start it; this isn't an ideal, or safe, means of operation. For this purpose, I suggest that you use a plug clip with wires, or one of the remote plug connections now available.

After starting the engine, we performed the mandatory throttle-

(Continued on page 130)



The transmitter portion of the Futaba FP-5NLH system contains all the features needed for successful operation of nearly any collective-pitch-equipped heli. Has nice feel, too.

Helicopter Challenge

by CRAIG HATH

SO YOU'VE MASTERED the basics of flying an R/C model helicopter, and the machine will do what you want it to do. Want a new challenge that will really add to your bag of tricks? Try autorotations—maneuvers that make sense, because, in the event of engine failure or some mechanical malfunctions, an autorotation might prevent your machine from crashing.

Bob Pickens at work on his autorotations. With his machine in a deep flare, he pulls back on the cyclic pitch, which converts all of the forward motion into rotor energy. This flare angle is a little steep for beginners, but Bob likes to get his helicopters out of the sky in a hurry.

Bob is now starting to feed in the collective pitch, and he's beginning to get the helicopter flattened out for the touchdown. This takes a lot of finesse.

Bob has the helicopter leveled out and ready to touch down. He has fed even more collective pitch in, which converts the blade energy into lift. Holding the machine off of the ground, he allows it to settle gently to the landing. Easy, huh?

Let me introduce you to Bob Pickens. At my flying field, Bob is known as "Mr. Autorotation." He's a pretty good stick when he's handling a model helicopter, and when he's performing "autos," he's world-class. I've seen Bob burn tank after tank of fuel, doing nothing but shooting autorotations. He takes a little circle of plywood that's covered with Astro Turf to the field, and he thoroughly enjoys himself as he hits that circle time after time. Bob has added some new terms to the English language and redefined some others, shouting out phrases like: "full down babycakes" and "lots of peanut butter left on that one."

Here are some questions that I asked Bob, along with his responses:

Why do you perform auto after auto?

"It's fun, and I'm still trying to win the autorotation spot-landing contest at the Merced Fly-In. The first time I went to Merced, I was watching guys like Robert Gorham and Gilbert Ruiz do autos. They played leapfrog with their machines and landed on one pad after another. They took their helicopters up until they could barely see them, cut the engines off doing spirals and turns, and still hit the pads right in the middle. This really impressed me, so from that day on, I decided that was for me."

Were you able to just go home and start doing autos, or was it a little more difficult than that?

"First, before attempting to go for a 'full-down' autorotation, I wanted to learn as much as I could about how the other guys set up their machines and what the actual radio commands were as the maneuver was being performed. Once I had the information, and had a pretty good idea of the requirements, I began shooting practice autorotation approaches by pulling the throttle off and letting the machine settle to an imaginary landing pad at around 10 feet high. As soon as the helicopter was on the verge of a stall, I'd abort the auto by powering up and going around for another attempt. These first practice attempts were done by simply reducing the power to idle and allowing the machine to settle. After gaining some confidence, I began to hit the throttle-hold switch and abort at anywhere from 10 feet to 1 foot off of the ground. By the second weekend of practice, I felt pretty sure that I could go all the way to the ground, and the first full-down autorotation was successful; in fact it was very good!"

What about the subsequent autorotating, and how successful has your track record been overall?

"I may have had some sloppy landings early on and bounced a few machines around trying to get to that

spot, but it was a long time before I actually broke anything on the helicopter. I think that after about four years of shooting autos, I've only crashed twice. One time, I was trying to get positioned so that you could get the great camera angle that you kept yelling out to me! Looking back, it seems that autorotations are like hovering: once you have the basics, you do it at will. Some autos are better than others, but they're almost always successful."

How important do you think set-up is to good autorotations?

"When you're learning the auto, set-up is critical. As you progress, you'll be less prone to dumb-thumbing, and set-up won't be quite as important, but it's always a factor."

What are your basic set-up parameters, and can you offer any tips?

"First, your machine must utilize an autorotation clutch. I've heard that it's possible to autorotate without one of these clutches, but I've never seen it done. The clutch is a device that allows the main-rotor head to continue to freewheel, while all the other mechanics, like the tail rotor and main drive gear, stop moving. This eliminates the added drag produced by those moving parts, and it allows the rotor blades to turn much more freely. You'll also need:

- a 50 or 60-sized helicopter with a rotor-disc diameter of at least 50 inches
- a 5-channel (or more) radio system, with at least throttle-hold capability
- rotor blades that weigh 160 to 190 grams each (the closer to 190, the better)

Have the machine trimmed and ready for flight.

"If you hover well and can get into and out of forward flight with power descents, then you ought to be able to do an autorotation. Flying nose-in might be an asset, but it isn't mandatory for doing autos. Just make sure the chopper flies past you before you get to the flare position of the auto.

"Don't weight blades unless you have thrust bearings on the blade grips, and I don't see any advantage to weighting over 190 grams per blade. Anything in the range of 190 to 160

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Dan Melnik demonstrates a full down auto in tight quarters. Once you have the knack for it, you won't need much area to work in.

Tom Hart loves to do his autos to a pad directly in front of himself, nose on! Don't try this until you've mastered both nose on and autorotation. Tom sure has fun with these.

HELI CHALLENGE

will perform the auto with relative ease without sacrificing a great deal of cyclic authority (as the weight of the rotor blades increases, the rotor head is slower to respond to control inputs). If you're adding blade weight to a set of blades that aren't designed for weight, be sure that you know how to build your own rotor blades safely. I recommend that you purchase a set of the pre-weighted rotor blades from your kit manufacturer or from an after-market rotor-blade source. Improperly weighted blades or poorly constructed blade holders are very dangerous—much like looking down the barrel of a loaded gun.

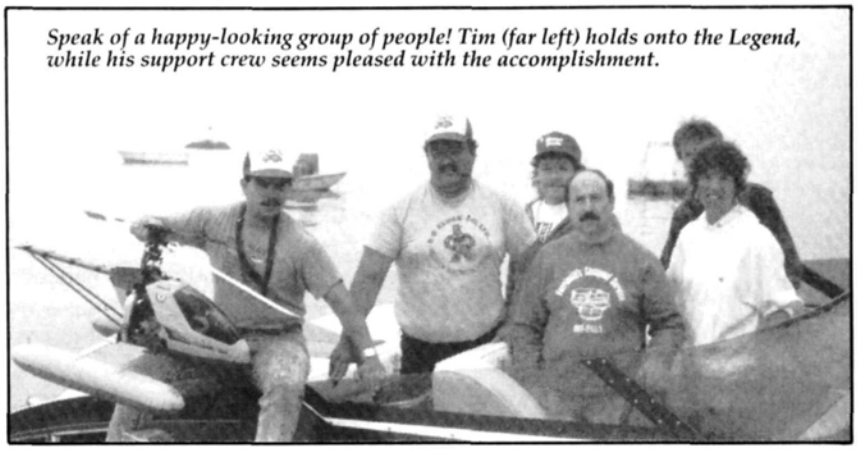
"The machine should be trimmed and flying as smoothly as possible. If your radio system has separate pitch curves for the throttle-hold function, your job of setting the machine up for autos will be simplified. If not, you'll need to compromise your normal flying pitch curve with your autorotation pitch curve, as the two have some very different requirements.

"I don't recommend the 25-size helicopter. Most of them will auto if properly set up, but they leave no margin for error. The experts usually have their hands full trying to auto these machines because of their size. The name of the game is *inertia*, and small choppers come up short because of low mass and weight. Stick to a helicopter in the 50- to 60-size class with at least a 50-inch rotor diameter in the pod-and-boom configuration. (To avoid needless damage during the learning process, save your beautiful scale body until you've perfected the auto.)

"With pitch settings, a good place to start is with a pitch curve that ranges from -4 degrees to at least +10 degrees, or more, on the top end, if you can get it. A lot of positive pitch will save a badly executed auto (lots of pitch can make up for low rotor speed). If you've flared early, added pitch too soon, and you're at 10 feet with no forward speed and the blades have lost considerable speed, the extra pitch might help you avoid disaster. If your radio won't allow for a separate pitch curve for throttle hold, set your pitch curve so that you have around -3 degrees on the low end and +10 on the high end. Be careful when flying around normally, as this setup will be a little sensitive on the collective stick, and it could overload the engine at full throttle.

"The engine must be dependable and must have sufficient power to fly the chopper. It must idle reliably at a speed below clutch-engagement speed, and it should be adjusted so that it will drop to this speed as soon as the throttle is reduced or the hold switch is activated. Be sure that you set the throttle-hold point so that the engine drops to a dependable idle when the switch is activated. (Throttle-hold prevents the throttle from functioning while the collective pitch is operated.

(Continued on page 111)



Speak of a happy-looking group of people! Tim (far left) holds onto the Legend, while his support crew seems pleased with the accomplishment.

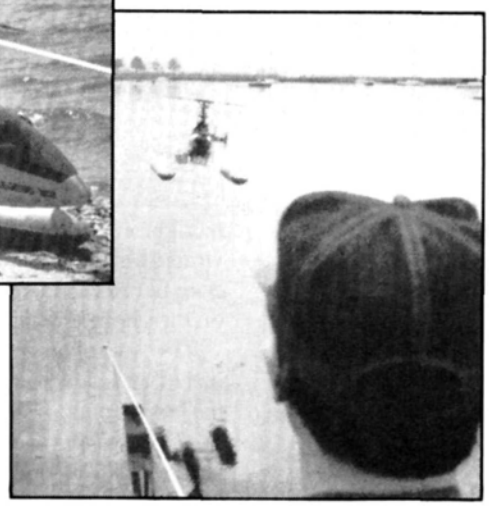
Repeating a first of 10 years ago, this time rotary winged.

FLIGHT ACROSS LONG ISLAND SOUND

by TIM DIPERI & ROLF KLUGE

WE TALKED ABOUT flying a helicopter across the unpredictable waters of Long Island Sound for many months before we actually did it. To commemorate the 62nd anniversary of Charles Lindbergh's historic transatlantic flight, we gathered to see the first R/C helicopter fly some 15 miles from New York to Connecticut.

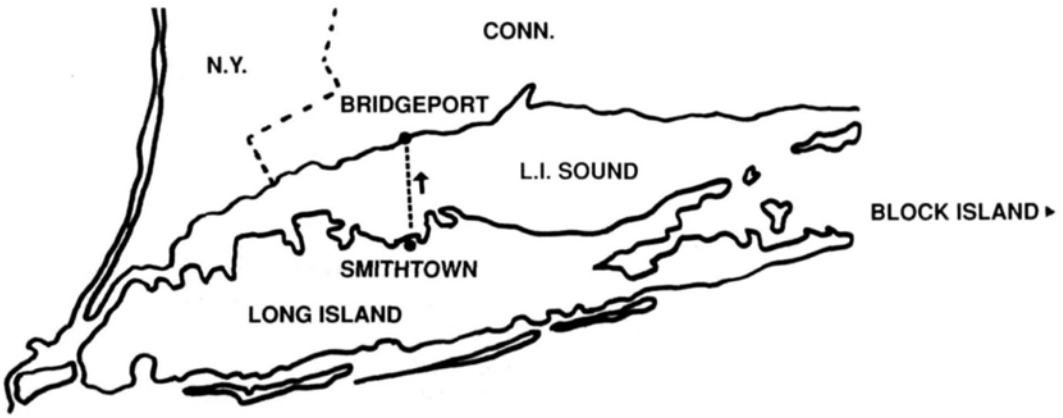
R/C heli pilot Tim DiPeri had flown a fixed-wing R/C airplane across the Sound 10 years before, on May 21, 1979, both to mark Lindbergh's historic solo flight and to highlight the ever-increasing interest in R/C flying in general. Now we had two *new* reasons to celebrate: It was the 10th anniversary of Tim's fixed-wing crossing, and R/C helicopters have become quite capable, reliable and popular.



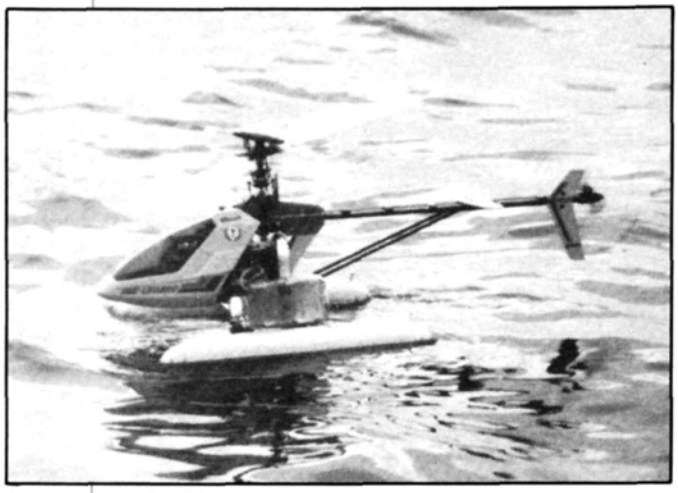
Above: Stock GMP Legend fitted with pontoons languishes in the Long Island sun after its record flight.

This time, Tim was to fly his GMP* Legend, and even though the machine was equipped with pontoons, this flight would be a do-or-die endeavor, because a crash landing would be disastrous (salt water is every R/C machine's natural enemy!).

Six days before the flight, we made a "dry run" to confirm the flight path, and after this, we felt



The 15-mile route of the commemorative heli flight.



Top photo: Safely touched down at the end of the flight, machine had sufficient fuel remaining to do two more legs. "Pilot fatigue" was the limiting factor.

Above: Early testing was performed to determine just how well the machine would fly (and float) with pontoons installed, should the need arise.

confident that, on "the day," we'd have a good chance of being successful.

The big day started badly; we were very disheartened by the bad weather, which made it seem that all the hard work and planning would be wasted. Would we have to go home, defeated? After anxiously waiting almost an hour, we decided to give it a go. Tim, as pilot, and yours truly, as co-pilot/navigator, climbed aboard the chase boat, which was provided by Parrinelli's Cesspool Service. The rest of the crew traveled on the photo boat provided by Patio Pizza.

Tim soon had his machine started, adjusted and airborne. We signaled Vinnie, the boat captain, who smoothly accelerated to the maximum cruising speed, and in almost no time, our high-speed chase boat had left the photo boat behind. Following the Legend, the chase boat was doing well over 50mph, and the heli was only at about half collective/throttle!

During the 30-minute trip, we experienced some engine variations, which were probably caused by salt and air density. At one point, the variation was so great that the helicopter dropped to within 5 feet of the water, but even more alarming, it "buzzed" the boat! We were quite shaken, but after that, it was smooth sailing.

Despite the rain and low cloud, we were right on target, and about three miles off the Connecticut shore, we could see the landing point becoming increasingly visible. By this time, however, Tim's left hand was falling asleep! But we couldn't give up now! With some encouragement and some left tail-rotor trim, Tim somehow kept going.

Everything looked great now: We were about 1,000 yards from the dock in Connecticut, and we were in a 5mph zone. (Unfortunately, the helicopter cruised by us at 50mph!) After a lazy 360-degree turn, Tim brought the helicopter back to a slow forward hover, but not before making some "accidental" passes close to a few sailboats manned by some surprised, and curious, sailors.

As we approached our landing point, we knew that all we had to do was bring the machine down slowly, but because we were on a bobbing boat, it was difficult to aim for the floating dock. That's where Tim's experience really showed! As he set the machine down smoothly, history was made once again!

We've already mentioned that this epic flight was accomplished with a GMP Legend, and here are some other details you might want to know:

- Engine: Enya 60 (donated by Action Hobbies)
- Fuel Tank: 1000ml
- Fuel: 15-percent Cool Power
- Gyro: JMW (Miniature Aircraft)
- Muffler: Magna Pipe (Miniature Air craft)
- Radio: Futaba PCM 8-channel
- Pontoons: Kalt
- Rotor Blades: Donated by L&O Models reflex (Len Mount)

Fortunately, the entire system worked flawlessly, but a back-up machine in almost the same configuration (except for a shaft-driven tail and a Y.S. .60) was ready in case of machine failure.

We thank our sponsors: Action Hobbies, Parrinelli Cesspools, Patio Pizza, R-G Kluge Co. and *Model Airplane News*.

Even without sunshine, it was a very successful and enjoyable day, and this flight was only the *beginning*, both for us and other pilots! Who knows what events we'll see in the future! Anyone like to try the Grand Canyon?! Any ideas?!

**Here's the address of the company mentioned in this article:*
***GMP** (Gorham Model Products), 23961 Craftsman Rd., Calabasas, CA 91302.* ■

U.S. HELI TEAM SELECTIONS

by DATU RAMEL

The country's best compete for a spot on the F3C World Championship Team

PHOTOS BY DATU RAMEL

Robert Gorham does some demo flying with a Schluter Magic under the watchful eye of Mark Powellson.

LAST JUNE, THE Top American FAI model helicopter pilots gathered in Dayton, OH, to compete for spots on the '89 World Championship Team. Three rounds were flown on Saturday in varying conditions, and the big story of that first day focused on '88 National Champion Cliff Hiatt, who had something go wrong on each of his three flights. During his opening flight, Cliff was docked 10 percent or more of his score because he announced and performed one maneuver of the FAI pattern out of sequence. Cliff demonstrated his fine sportsmanship and talked to us about this costly mistake—one he hasn't made since his early days of flying in R/C contests 15 years ago.

The weekend's only "incident" took place on Saturday: Don Chapman's distant 180 autorotation out in the tall grass.

In the second round, a cold front came through, and the contestants faced a gusty, swirling wind that Cliff described as "wicked." After the second rotation of pilots, CD Mark Wilson stopped the contest for four hours when tornado warnings were posted in nearby parts of southwest Ohio. The third round didn't begin until 6:30 p.m.

In round three, Cliff Hiatt was all set to make a big jump in the standings with a beautiful, high-scoring flight when he autorotated to a landing outside the 10-meter "box." The fly-four-rounds/discard-low-score format might have saved him if he had had two or all of those things happen during one round. The points Cliff missed in the first round were too much to overcome, and that set the scene for the outcome, which was the big story of the

The '89 U.S. FAI Worlds Team: Tom Dooley, Team Manager Cliff Hiatt, Tim Schoonard and Robert Gorham.

Standings After Round 1		Standings After Round 2		Standings After Round 3		Final Standings	
Pilot		Pilot		Pilot		Pilot	
Robert Gorham	223.0	Robert Gorham	417.0	Tom Dooley	637.0	Tom Dooley	663.5
Tim Schoonard	202.5	Tom Dooley	410.0	Robert Gorham	634.5	Robert Gorham	652.5
Tom Dooley	199.0	Tim Schoonard	402.0	Tim Schoonard	632.0	Tim Schoonard	652.5
Ted Schoonard	194.0	Ted Schoonard	396.5	Ted Schoonard	618.5	Ted Schoonard	644.5
Wayne Mann	192.5	Clifford Hiatt	381.0	Clifford Hiatt	596.5	Clifford Hiatt	644.5
Mike Mas	190.0	Mike Mas	378.5	Wayne Mann	590.5	Wendell Adkins	629.0
Wes Suggs	182.5	Wayne Mann	372.0	Mike Mas	588.0	Wayne Mann	607.5
Clifford Hiatt	178.5	Jerry Vargas	365.0	Jerry Vargas	579.5	Jerry Vargas	604.0
Jerry Vargas	178.0	Wes Suggs	363.5	Wes Suggs	569.5	Mike Mas	600.0
Dan Melnik	172.0	Dan Melnik	357.0	Dan Melnik	565.0	Wes Suggs	587.0
Douglas Law	161.5	Douglas Law	335.0	Douglas Law	542.0	Douglas Law	586.5
Dan Chapman	157.0	Dan Chapman	330.5	Don Chapman	464.5	Dan Melnik	585.0
Don Chapman	148.0	Don Chapman	287.0	Wendell Adkins	414.5	Don Chapman	464.5
Wendell Adkins	0.0	Wendell Adkins	199.5	Dan Chapman	33.1	Dan Chapman	330.5

weekend: the story of two people who made this contest an inspiration to sport pilots everywhere.

Just before sunset on Saturday, Wendell Adkins was out later than most of the others because he had drawn the last flying slot of the wind-racked day. The failing light and resultant low visibility kept Wendell busy. He probably had enough on his mind already, because in round one, he zeroed (car racers call this a "black flag") when he flew his Schluter beyond the boundaries defined by the very stringent FAI rules. At the last Team Trials two years ago, a pilot, who shall remain anonymous, started this "tradition," and it was Wendell's misfortune to get the horn this time.

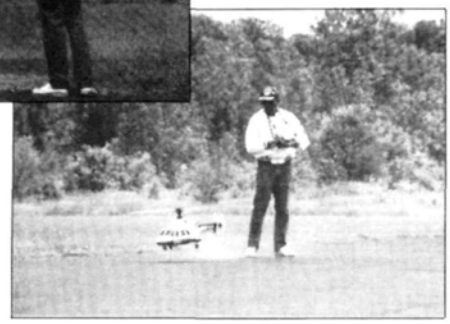
In round three, Wendell knew that the goose-egg flight left him no throwaway round. Add the difficulty of doing aerobatics in front of weary judges and you'll see that the pressure was on. He scored 215, and on Sunday he posted 214.5—enough to skyrocket him from last place to a solid 6th, just slightly more than 5 percent behind the top finisher. At the '87 Team Trials, Wendell ended up 8th, some 11 percent off the pace, and his scores this year were not only much closer to those of the winners, but also placed him higher than a past National Champion and a couple of well-known demonstration pilots. Hats off to you, Wendell!

Last May, I talked to Atlanta pilot and SEARCHPA founding father, Tom Dooley. He's another experienced FAI pilot and was 6th at the '87 Team Trials—9 percent behind Robert Gorham, whose name isn't exactly a household word. We talked about his preparation for this year's Team Trials and about his role as a challenger to the top pilots. He said that even if your performance is on a par with those of the famous names and established winners, it still might not be good enough to win. Judges usually award a tie to the champion or incumbent. You must skate, box, or fly *noticeably* better than a star to overcome the little courtesies (what the Europeans call the "halo" effect) that are extended to a winner. I asked him, "What if, after all your practice and preparation, you can only reach, but not surpass, the top levels of performance?" His answer? "You must be ready to do your best if, and when, one of them has a bad day."

This year, the "percent-behind" amounts will be calculated using Dooley's 1st-place total of 663.5. Even if the unfortunate Hiatt had put together one of his let's-win-the-Nats killer rounds and had taken a top-three spot, as expected, Dooley would still have gained a spot on the U.S. team, because he just flat outpointed some other hot fliers. Tom took the lead after round three and never looked back. He averaged 221.17 points a round and 8.19 points a maneuver (a 270 round is perfect). Dark horse Tom Dooley now has his own "halo" to go with his dark glasses. In a future issue of *MAN*, we'll have a report on how he made out at last summer's RC Heli Worlds. Tim Schoonard and Robert Gorham finished with identical scores, and they'll join Tom as our national representatives. Over the last five

Team selection contest officials.

U.S. HELI TEAM SELECTIONS



Above & Right: Don Chapman's Schluter Junior 50 Bell 222.

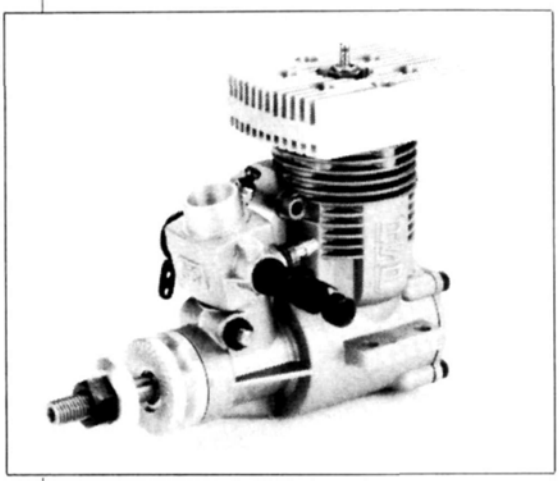
years, Robert has distinguished himself as a consistent world-class pilot (Ontario in '85 and Bern in '87), and this is the third time that he'll fly for the USA at the Worlds. Despite his relaxed manner after the contest, Tim must have been very, very excited about his team placement: He'd waited over two years for a second chance. In May of '87, at this same Dayton flying field, Tim Schoonard's aerobatic effort (he and brother Ted defied '87 wisdom by performing rolling stall turns when everyone else was doing "shovels") got him to 4th behind Gorham, Youngblood, and Mas, so earning him the alternate spot instead of a berth on the team. Cliff Hiatt and Ted Schoonard posted identical scores for the alternate spot this year, and Cliff was later appointed team manager.

And what about that other household name?—Curtiss Youngblood. He didn't have to enter this contest. In FAI, the reigning World Champion is automatically invited to compete in the World Championships and doesn't have to qualify for a national team. (Curtis drew a bye for the opening rounds.) Youngblood, Dooley, Schoonard and Gorham will be flying against the best in the world in Virginia this August.

Concentration, precision and practice...Wendell Adkins warms up.

Can the 1987 champion handle the change in rules from optional to compulsory aerobatics and finish as well? Will the third time or the new beard be a charm for our Californian pilot? If a dark horse wins, as Tom Dooley did, does he become a favorite? The R/C Heli World's promises to be the best model helicopter event ever. Stay tuned for more FAI contest stories. ■

ROTARY-WING ROUNDUP



ASP .46 FSR ABC

The ASP .46 FSR ABC helicopter engine is perfect for any .40- to .45-size helicopter. Its easy-to-operate carburetor and reliable high power set it apart from other engines in its class. The ASP .46 features a one-piece hardened-steel crankshaft; mirror-smooth, true chrome plating on the cylinder sleeve; Schnuerle porting; ABC piston/cylinder assembly; ball bearings; a large, deep-finned cooling cylinder head and a new two-piece crankcase.

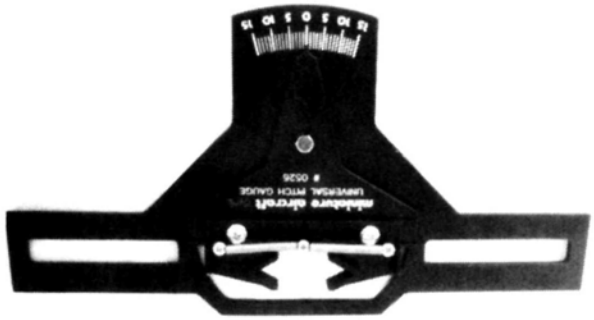
ASP .46 FSR ABC helicopter specifications: Weight with muffler: 12.1 ounces; idle rpm: 2,150; top rpm: 13,300. Carburetor: high-speed needle, idle cam screw. Fits most .40-size mounts.

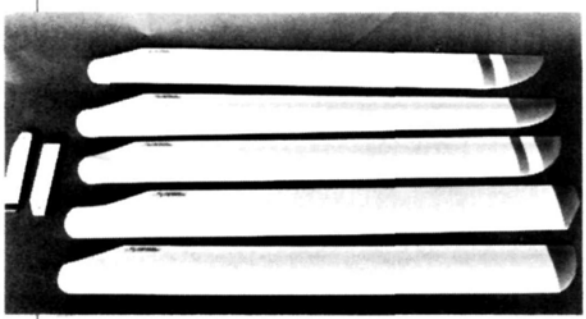
For more information, contact World Engines Inc., 8960 Rossash Rd., Cincinnati, OH 45236.

PROFESSIONAL PITCH GAUGE

Precision Professional Pitch Gauge is a new design from Miniature Aircraft USA. It has a full 30-degree sweep with an excellent blade grip and single-pointer convenience. It has a convenient "sight" for top or bottom flybar styles and a locking feature for accurate readings.

For more information, contact Miniature Aircraft USA, 2324 North Orange Blossom Trail, Orlando, FL 32804.





ROTORSPORT PRO-BLADES

Rotorsport Pro-Blades, the latest in Kevlar construction, are upper and lower molded in titanium plates with machined-brass bushings. They're precision CG-corrected and balanced, and there are three airfoil styles to fit most popular applications. 185 G and 200 G versions are available in matching tail-rotor blades.

For more information, contact Miniature Aircraft USA, 2324 North Orange Blossom Trail, Orlando, FL 32804.

NEW CATALOG

Over 24,000 small, off-the-shelf inch and metric-drive components manufactured and marketed by Stock Drive Products are contained in the new '88 edition of its 768-page *Handbook of Standardized Components*. Subtitled Master Catalog 757, it features 55 pages containing 1,355 new SDP components, principally mini-HTD timing belts and pulleys that offer curvilinear deep-tooth profiles. Also included are four pages of polygon profile shafts, couplings and adapters for high-torque applications, plus a series of AGMA9 quality molded gears and sub-miniature roller chains and sprockets. A special feature of the catalog is a pre-numbered registration card that entitles the recipient to receive a current SDP price list plus, at nominal charge, an extensive technical reference handbook.

For more information, contact Stock Drive Products, 2101 Jericho Turnpike, New Hyde Park, NY 11040.

SUPER STARTER 60 AND 120

These two new starters from Robbe are the latest in a new breed of high-torque starters. The Super Starter 60 will start most engines up to .60. For really stubborn starts, the Super Starter 120 is just what you've been looking for. These starters are available exclusively through Robbe Model Sport.

For more information, contact Robbe Model Sport, Inc., 180 Township Line Rd., Belle Mead, NJ 08502.

OMEGA JET STREAM FROM KALT

The Omega Jet Stream is a member of Kalt's new generation of fully aerobatic helicopters designed for competition. Features include: lightweight fuselage with detachable cabin area for easy maintenance; linear tail-rotor pitch system; helical tail-rotor gears; ball-bearing controls; and 10Sll rotor head. Rotor diameter: 5 feet, 2¼ inches, radio: 5 or more channels.

For more information, contact Hobby Dynamics Distributors, 4105 Fieldstone, Champaign, IL 61821.

BEAVER

(Continued from page 84)

jack is just behind it. I cut a small notch in the cowl to allow the head lock to be slipped through. Don't forget to install a tube on the engine vent port so that oil can be squirted in after a run.

PERFORMANCE: After a full charge and a final system check, I installed the wing, remembering to put a little Loctite* on the strut threads after they had been properly aligned, and locked them into place. Check your ailerons and flaps for correct operation and fuel up. I put one of those nifty quick fuelers in the cowl, and I recommend that you do, too. Start the engine, and check for power and a good idle.

Now for the moment of truth! Taxi around to get a feel for its water handling, and set the flaps at 25 degrees. Turn into the wind, and add up-elevator while bringing the power up gently. As soon as it comes up on the step, relax most of the aft stick, and the ship will fly right off the water in about 80 feet, accelerating all the way. Back off on the power, and bring the flaps up gradually as you gain altitude. During your stall tests, you'll find that the Beaver stalls gently straight ahead, and if the flaps are down at all, the ailerons will fly all the way.

On landings, gradually throttle back while adding flaps. I found the ship had little pitch-up tendency as long as I didn't dump the flaps all at once. Don't use full flaps until you're on final, and be prepared to add a little power just before touchdown, since full deployment of the flaps will rapidly bleed-off your air speed. In fact, for your first few landings, don't use more than 35 degrees of flaps. Now taxi back to the ramp and cut the switches. If *that* hasn't impressed 'em, nothing will. Happy landings!

**Here are the addresses of the companies mentioned in this article:*
Unionville Hobbies; *distributed by MDM Models, P.O. Box 739, Rancho Murieta, CA 95683.*
Ikon N'West, *P.O. Box 566, Auburn, WA 98071.*
Sig Mfg. Co., *401 S. Front St., Montezuma, IA 50171.*
Carl Goldberg Models Inc., *4734 West Chicago Ave., Chicago, IL 60651.*
Dave Brown Products, *4560 Layhigh Rd., Hamilton, OH 45013.*
Formula-U; *distributed by Pactra (Plasti-Kote), 410 N. Michigan Ave., RM. 1280, Chicago, IL 60611.*
Northwest Hobby Supply, *13923 Pacific Ave. S., Tacoma, WA 98444.*
Saito; *distributed by United Model Distributors, 301 Holbrook Dr., Wheeling, IL 60090.*
Loctite Corp., *4450 Cranwood Ct., Cleveland, OH 44128.* ■

SPORTY SCALE

(Continued from page 30)

some how-tos and throw in a few "newsbreakers." Until then, try to practice and remember some of the basic rules that go hand in hand with being an expert pilot like you: Never increase the lubricating properties of your fuel with olive oil; never transport your scale model to the field on the roof of your car—with only the tail wheel strapped down; and the same clear silicone that you use on your wing saddle will *not* allow your canopy to slide open more easily. Although these are the inviolate rules of R/C scale, they, too, can be forgotten if you forget to check your six!

**Here are the addresses of the companies mentioned in this article:*
Model Engineering, *P.O. Box 58306, Raleigh, NC 27658 (919) 872-7569.*
Hobby Poxy Products, *36 Pine St., Rockaway, NJ 07866.* ■

SCHNEIDER CUP

(Continued from page 41)

and, of course, the actual planning of just how the competition would be structured.

As word spread about this exciting new

(Continued on page 108)

The Freedom 20™ Proof positiv

The Freedom 20's instruction booklet makes building easy—even if you've never built a model before.

Clear illustrations guide you through every step of construction and equipment installation. Covering materials and techniques are described, plus there's a section on adjusting and flying your plane.

SCHNEIDER CUP

(Continued from page 106)

event, we began to hear from people who were going to draw plans for these aircraft. Some already had plans for aircraft in wheel configurations that were large and would have to be blown up only a small amount to qualify (e.g., Nick Ziroli's Sopwith Tabloid). After all, many of the early Schneider racers were land planes to which floats had been added. As time went on, more designers were putting out plans for Schneider racers, and many more will be available in time for the '90 Schneider event in Lake Havasu. From the slow Deperdussin and Tabloid to the speedy Supermarine S-6B and Macchi MC-72, dozens of plans will soon be available.

How do you plan an event like this? Do you choose a year and only allow aircraft from that year to compete? Or do you pick a period of years? Both ideas seem too restrictive. It's difficult to hold an event with only four or five entries. If you choose to allow all Schneider racers from '13 to '31, how can they fairly compete? If you race them, everyone would build the racers from the last couple years; after all, they were the fastest. Can you imagine four or five identical aircraft (right down to color scheme and race numbers) racing around pylons? Which one is which? The spectators, the judges and, of course, the pilots would have an impossible job, and it could prove to be extremely dangerous.

For an equalizing effect, we decided to split the scoring into three separate categories:

STATIC: In this area, as in other scale events, the aircraft will be judged for authenticity to scale, workmanship, etc. All aircraft will have an equal chance.

SPEED: Each entrant will fly his aircraft at a speed that's as close to scale of the original as possible. For example, the Supermarine S5 (N220) that won in '27 with a speed of 281.655mph had a 26-foot, 9-inch wingspan (321 inches). Divide 321 inches by 85 inches (minimum wingspan allowed), which equals 3.776. Now divide 281.655mph by 3.776 to get the speed the model must fly—74.59mph. Maximum points will be awarded to perfect speed; points will be lost for any speed under or over the correct speed.

FLIGHT: The flight of each aircraft, including takeoff and landing, will be scored on the basis of how realistically it emulates the original. Each aircraft will be required to fly a number of laps around a pylon course at reasonably low altitudes. This will be repeated several times, with the best three flights averaged for the final points of this category.

During the original Schneider events, each aircraft had to prove its seaworthiness. Therefore, these models will be required to be moored for a time to ensure that they, too, can stay afloat.

Next, judges had to be selected. But from what field should our judges be chosen? Should they be members of our club, or maybe celebrity R/C folks? No, we wanted to make sure the people we chose were extremely knowledgeable about Schneider aircraft. We came across several people while researching the Schneider series who would have qualified, who stood out in their knowledge of the aircraft *and* the event. But we were looking for something special, and so we added an extra requirement. Since we wanted four judges, and over the years four countries have won the Schneider Trophy, we decided to try to get one judge from each country. This would imbue the event with an international spirit, and interest from Europe was more than welcome.

At this writing, we have confirmed American Robert S. Hirsch, aviation his-

torian, and England's David Boddington, author of several books, editor of a British R/C magazine and frequent participant in R/C Schneider events held in Europe. We are currently negotiating with a French and an Italian judge who will complete our international team. With these distinguished gentlemen, we believe that our judges will be equal to this unique event.

Who Are The Contestants?

Telling you about each and every contestant, with stories and details of his or her individual trials and tribulations, may or may not be of interest. I don't have to make that decision now, however, because the entry has just opened, and of the more than 200 people who say they are building an aircraft for our Schneider event, it's likely that approximately 30 will be complete in time for this year's event. What I *can* tell you is that we know that the Supermarine series (S-4, S-5 and S-6B) and the Macchi series (M-33, M-52, M-67 and MC-72) are the most popular choices. In all, there are 17 different aircraft brands or models chosen by those who have stated what they're building, of which (to my knowledge) only a Deperdussin and our Curtiss R3C-2 have flown successfully. It's early summer at this writing, and a Macchi M-33 of Bill Young's is scheduled to fly soon, and this unique entry is *electric*-powered.

Who are these contestants, you ask? They are adventurous folk who see a challenge and seek to go beyond the ordinary, to stretch their imaginations and ply their special skills. These are the magnificent men with their flying machines! Plans are in place and there's a lot of scurrying going on now to make the November event. *MAN* looks forward to being on hand to bring you full coverage. ■

GIANT STEPS

(Continued from page 53)

tion (IMAA*), and I recently received a response to my comments from Jim Alley, IMAA's vice president. Jim says that IMAA's membership continues to grow, as does the number of chapters. Members now number more than 5,000. Jim also says that AMA considers IMAA to be among its best organized and most active "Special Interest Groups," but this comes as no surprise to *me*.

Having been involved with IMAA since its formation, I know it has its share of dedicated, capable people. Jim will be running for vice president again, and I'll be among his supporters, because he's a good man and, until his recent retirement, was an FAA flight inspector. If you're into *big* airplanes, you should be into IMAA !

Pamper Your Power

With winter daily becoming more of a reality and the end of the flying season facing all you snow-belters, don't forget to take care of your radio batteries during the "off" season. I know I've neglected mine, and I'm sure some of you have neglected yours. You put the transmitters away on the shelf, perhaps leaving the flight batteries in the models, and you don't give them a thought until spring. This isn't a good idea, but we still do it, don't we?!

Given the fallibility of our memories, why not keep a log of your batteries and charge them periodically during the winter? If you have some sort of battery cycler, recycle your batteries regularly and log the cycles each time you do. With five radios, I cycle two a month during the no-flying part of the year, keeping track of the details as I do so. Doing so alerts me to any changes in any part of my radio gear. A short discharge cycle can tell me

(Continued on page 111)

GIANT STEPS

(Continued from page 109)

I have a bad cell, or pack, and the absence of any abnormality assures me that all is well. Keeping a simple log of the cycle dates and times ensures that I don't neglect a radio I haven't used much during the previous season. Best of all, I seldom have unexplained radio problems, and that, in itself, makes the whole process worthwhile.

I've also been keeping track of the age of my battery packs, and at the first sign of a problem, I replace the pack. While it's true that you can often get a "good deal" on Ni-Cds, it isn't usually worth the risk. In my experience, if you buy the best you can afford, you're seldom disappointed. Going for "cheapie" batteries is a false economy of the worst kind, because saving a few bucks here might ultimately lead to the loss of a model, and it just ain't worth it. Better to spend a dollar too much than a dime too little!

Well, that puts a wrap on another month. I hope you'll join me here next time for more information on *big* models. As we get into the building season, I'll tell you more of my favorite tricks and tips on building the biggies.

**Here are the addresses of the companies mentioned in this article:*
Bob Holman Plans, *P.O. Box 741, San Bernardino, CA 92402.*
DP Systems, *1842 Tattenhall, Houston, TX 77008.*
Clark Airscrew Industries, *RR4, Tottenham, Ontario, Canada L0G 1W0.*
IMAA, *R.A. Blaney (Secretary), 14 Parkview Rd., Long Valley, NJ 07853.* ■

PATTERN MATTERS

(Continued from page 58)

ceiver, leaving not only a switch, but a recharging jack as well. You might want to use an old telescopic antenna to get the receiver antenna out into the open. Put a crystal of your choice into the receiver, and turn it on.

In use, the monitor should buzz immediately if *no one* is on your frequency. Swing the antenna all around to check for anything that might be lurking in the distance. A signal being transmitted will kill the buzzer, as the receiver will find the signal and cause the Sonic Alarm to rest. If the receiver tracks a PCM signal, you'll hear a fast, intermittent click. Standard AM or FM signals will kill the buzzer or interrupt it (depending on the signal strength). At any rate, the whole thing will cost about $30 to $40, but it's well worth the small investment. For me, it means peace of mind.

My final item this month is something that we all use, but this is just a bit better. We all wrap our radio receiver and battery in foam in the plane (you do, don't you?), but we all have different ways of doing it. In the middle of a fat piece of foam, I cut a hole through which to insert the receiver. The thing is then stuffed into the plane with only a rubber band holding it in place. The people at M.A.P.* have a neat little foam pocket held together with Velcro fasteners, and it's perfect for any R/C application (see photos, and contact your local dealer for more info). This makes the chore just that much easier.

Well, pattern season is upon us all, and the winter-weather builders are hot into flying their aircraft put together during the cold season. After a long nine-month cold spell when I didn't fly (at all!), I wasn't much motivated to build. (This is called burnout!) I'm thankful that I was given a swift kick in the tail feathers, and now I'm back in the air. Wow! What a terrific feeling! It happens to us all, and happens all too often; but fly you must. If it appears that your motivation has fallen off the pipe, get a swift kick from someone! Being on the pipe and airborne has no equal. See you next time.

**Here are the addresses of the companies mentioned in this article:*
Macks Models, *23 Finchwell Ct., San Jose, CA 95100.*
LCS Performance, *P.O. Box 1273, Melville, NY 11747.*
Du-Bro Products, *480 Bonner Rd., Wauconda, IL 60084.*
Robart Manufacturing, *310 N. 5th St., St. Charles, IL 60174.*
Polk's Model Craft Hobbies, *346 Bergen Ave., Jersey City, NJ 17304.*
M.A.P. Products, *(Model Aviation Products), 160 W. 40th St., Suite 332, San Bernardino, CA 92404.* ■

HELI CHALLENGE

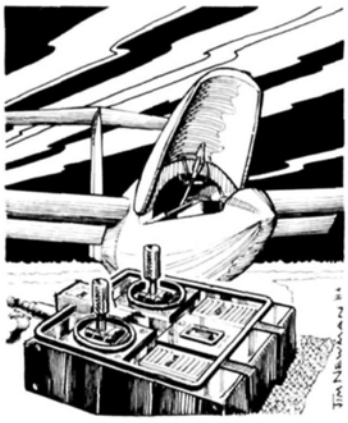
(Continued from page 96)

For autorotations, the throttle is held at idle.)"

Take us through the nuts and bolts of an autorotation:

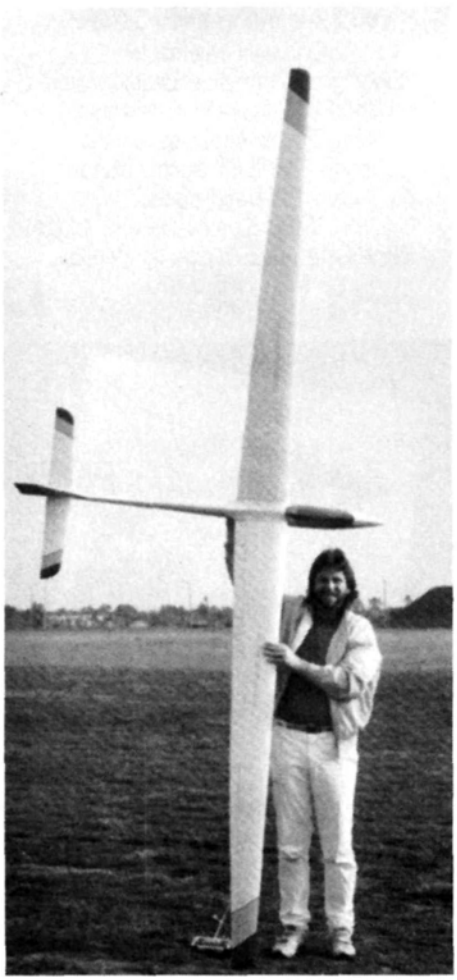
"Take the chopper to a good, safe altitude of at least 75 to 100 feet. In slow, forward flight, turn the nose into the wind. (Everything we do while learning this maneuver will be with the nose into the wind.) Reduce the throttle to idle with the throttle stick (not the throttle-hold switch). This move should be smooth and deliberate, all the way to the bottom of the stick gimble. Pay attention to the nose of the chopper: Does it pitch up or down as the throttle is reduced below clutch engagement? If the nose goes up, you need more

(Continued on page 120)



Quiet Flight

by JOHN LUPPERGER



Author with his 4-meter Alpina, which is controlled by an Airtronics 7SP with ATRCS computer. Model has an 18.5-ounce wing loading, but the ATRCS's equipped 7SP makes it easy to fly.

"CONTEST: ANY COMPETITION; especially one in which entrants perform separately and are rated for their performance."

Add to this definition from the American Heritage Dictionary that competition is what separates "play" from "sport." When the public actually sees people taking part in a model contest, it changes their perception of the activity; they tend to look at it as a sport, rather than as a "bunch of adults playing with expensive toys."

If you've never participated in a contest, you really should give it a try. You don't have to have a competitive nature to enjoy yourself or to learn from the experience. Having a set task to perform, as opposed to just flying for fun, can greatly improve your flying skills.

If your club is hosting some special event and you'd like to announce it in this column, send the relevant information to me at least three months in advance. Please limit your announcement to events that have more importance than club contests.

It looks as though there's a lot going on this summer and fall. Check out the events below, and see if there's one that you can attend. A contest is a great place to learn and make new friends.

Slo Flyers Electricfest

On September 16 and 17, the Slo Flyers of San Luis Obispo, CA, will hold their 2nd Annual Electricfest. Events included will be: 7-cell Sailplane; 7-cell Old Timer; Unlimited Sailplane; Unlimited Old Timer; Pylon; Sport Scale; and Pattern. Other events will be added if enough interest is shown.

Last year, every entrant received some sort of prize or award, thanks to the generosity of various manufacturers. Trophies will be presented to the 3rd-place winners in each class. For more information, contact Cal Drake*.

MARCS National Sailplane Symposium

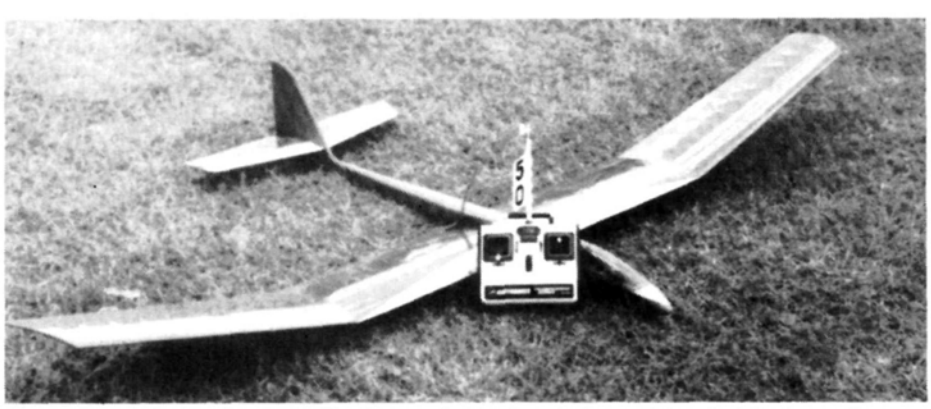
On November 4 and 5, the MARCS club of Madison, WI, will hold its 7th Annual National Sailplane Symposium. Those who wish to arrive a day early will be treated to a guided tour of the EAA museum at Oskosh.

At present, the scheduled guest speakers are: Michael Selig, John Donovan and Dave Fraser, all of whom will report on the Princeton low Reynolds number, wind-tunnel airfoil test results; George Steiner will address contemporary radio problems; Larry Jolly will speak on sailplane design; Ed Elaranto (University of Wisconsin Meteorology Department) will discuss thermal development; Walter Pankin of Germany will speak on tailless sailplane design; and Walt Good will tell everyone about the Militky Cup competition in Switzerland. There will also be table clinics, demonstrations and a banquet.

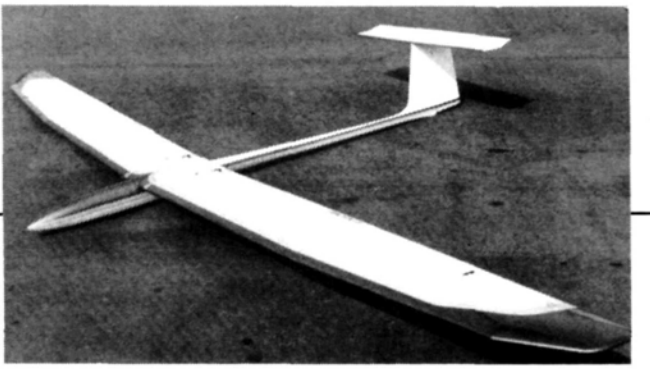
It sounds like a great weekend for anyone interested in model sailplanes. For more information, contact William Vogelsang*.

Tammany Gulf States Electric Fly-In

On September 30 and October 1, the Tammany Aero Club of Goodbee, LA, will hold its 1st Annual Gulf States Electric Fly-In. This sounds like a low-key event where the main objectives are to have fun and learn more about electric flying.



George Voss's Harlequin with E193 wing panels. For the windy conditions in Oklahoma, George liked the E193 panels better than the stock-modified E205 panels.



Clean lines of Larry Jolly's Winsome say, "F3B," but the model was designed for thermal duration (a good example of how we benefit from the technological advances learned in F3B).

The Fly-In will include: a fun fly (anything electric goes); an AMA scale electric event; workshops throughout both days put on by various electric experts; a swap shop where you can sell or pick up some great bargains; awards for 1st- through 3rd-place winners in scale, longest flight of the day by a sailplane and for a non-sailplane, most aerobatic model, most impressive model, and longest distance traveled to participate. On Saturday evening, all contestants and their families will be treated to a Cajun cookout.

For more information, contact Boyd O'Brien* or Ben Mathews*.

KRC Electric Fly

On September 16 and 17, the Keystone R/C club of Quakertown, PA, will hold its 10th Annual Electric Fly. This is one of the best-known electric events in the country and well worth marking on your calendar.

The Electric Fly will include: most rolls within 60 seconds; all up, last down; most loops within 60 seconds; maxi-flight on one charge, with landing and re-launch every four minutes. Each activity will include plaques and cash prizes to 4th place; special prizes for best aerobatic, best scale, most impressive, and most unusual aircraft; fun flying on both days; and an informal dinner buffet and social on Saturday night. For more information, contact Bob Kopski*.

Dallas Electric Fun Fly

On October 7, the Dallas Electric Aircraft Flyers will hold their 3rd Annual Fun Fly at Segoville, TX. There will be a general fun fly and an all up, last down for sailplanes and non-sailplanes, with a choice of prizes for winners. There will also be drawings for merchandise and gift certificates. Last year, over 24 pilots participated with close to 60 aircraft. For more information, contact Frank Korman*.

Harlequin Challenge

A while back, I put out a challenge for someone to build a couple of different wing sections to fit the Harlequin fuselage, which has flat sides where the wings plug on, so it's easy to change wing panels.

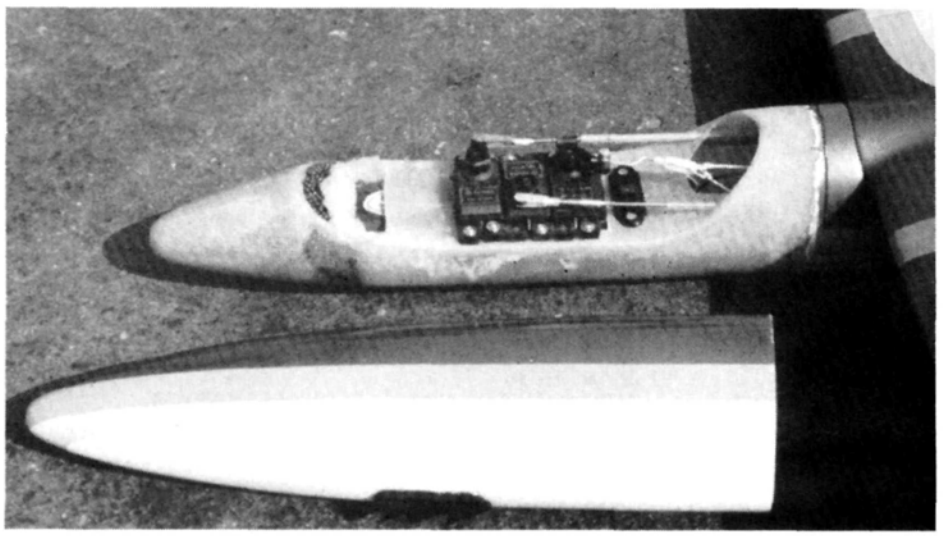
George Voss of Oklahoma City, OK, accepted the challenge and built the stock-modified E205 wings from the kit, as well as a pair of E193 wings. I was curious as to whether the average flier would be able to tell the difference when flying similar performance-type airfoils. Would they be that different? George's feelings on the project?

"Wow! This project turned into more work than I expected. I'm usually a fairly fast builder, but you'd never know it by the time I spent on this project. Therefore, I'm only going to be able to make the E193 and the original wings from the kit, at least for now. School, work and trying to establish a 'silent' club in OKC is eating up all my time, but if I ever do have the time to make the S4061 wings, I'll be sure to let you know how it turns out.

"The original Harlequin weighed 40 ounces with a MonoKote and paint finish. The finished panels weighed 7 ounces each, as did each E193 panel, for an identical flying weight of 40 ounces. The E193 wings were constructed as close to the original panels as possible. I used a 3/4x 1/32-inch ply TE that was laminated to a 3/4x3/32-inch balsa sheet to achieve a sharp trailing edge. Rib plots were ordered from LJM Associates*. I gave Lee the root size, tip size and quantity of ribs, and he very rapidly sent the plots to me. The paper masters were 'glue-sticked' to the balsa, and all the ribs were cut. Because the E193 wings are undercambered, they were slightly more difficult to build than was the stock-modified E205.

"Most of the flying was done in fairly windy weather: 15 to 20mph, which are typical wind velocities for Oklahoma. The original Harlequin wing has good penetration with the modified E205 airfoil, and the model has flown in winds with gusts up to 25mph. In 25mph winds and with a flying weight of 40 ounces, the model had marginal penetration. The thermalling ability of the original wing is good: You

(Continued on page 139)



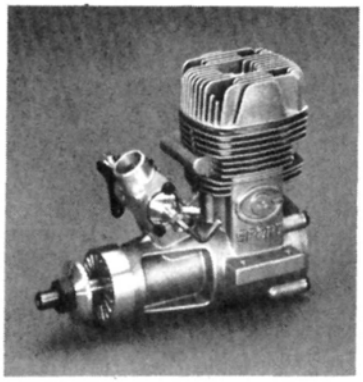
Front end of Winsome has a removable sheath, but, unlike F3B models, it has a full fuselage underneath instead of a ply keel. Plenty of room for the rudder, elevator and spoiler servos with the aileron and flap servos located in the wings.

Product News

WEST SYSTEM FINISHING EPOXY

John Sullivan Model Floatplane Products announces the addition of West System Finishing Resins to its product line. These finishing resins were developed by the Gougeon Brothers to construct laminated mahogany tri-hull racers. The odorless, two-part, 5-to-1, finishing resins brush on like varnish, they sand beautifully, and they're stronger and lighter than any other type of resin. West Finishing Resin won't attack polystyrene foam and doesn't "skin over" (allowing the application of a second coat with only minor prep work). Epoxy resin doesn't stick to your fingers or tools and will "wet-out" fiberglass cloth evenly, with a hassle-free working time of 30 minutes. A 5-to-1, metered-pump system is available, so resin mixtures can be stored in the cans.

For more information, contact John Sullivan Model Floatplane Products, 1421 Second St., Calistoga, CA 94515.



SUPER TIGRE SPORT ENGINES

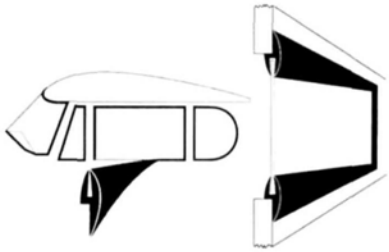
Supertigre has two new, economical engines that are perfect for the sport flier or the beginner. The Supertigre G-40 and G-49 sport engines use a nickel-plated, lapped piston for excellent compression without a ring. They also feature Schnuerle porting and new swing-style mufflers that allow the exhaust to exit at any angle.

For more information, contact Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

CENTURY JET MODELS ONE-PIECE ALUMINUM RETRACTS

Century Jet Models' newest product is its 1/4-scale, one-piece extruded-aluminum main retracts with oleo struts. Designed and built in Australia by J.M. Innovations, these retracts have a fully adjustable retract angle from 84 to 94 degrees, and they weigh only 22 ounces. The stainless-steel scissors rotate 360 degrees, and the lower cast-alloy struts have multiple axle positions and gear-door attachment positions.

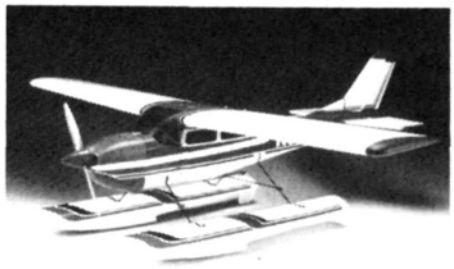
For more information, contact Century Jet Models Inc., P.O. Box 111, Rantoul, IL 61866.



FOURMOST PRODUCTS WINDOW FLANGE

The Fourmost Window Flange is a flexible black vinyl strip that has been preformed to make a perfect flange. As well as holding the window in place, the window flange provides a realistic black outline without the inconvenience of using tape. With just a razor blade and CA, it's easy to install in rectangular and contoured windows. The Window Flange is available in three sizes: .150, .250 and .350 inch, each sold separately in 4-foot coils.

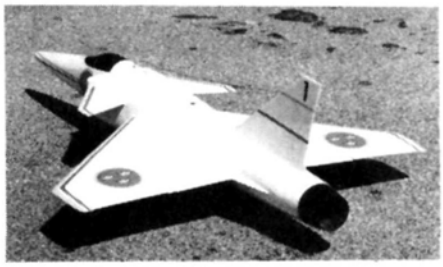
For more information, contact Fourmost Products, 4040 24th Ave., Forest Grove, OR 97116.



INDY R/C ARF CESSNA FLOATS

These new Indy ARF floats come 92-percent complete: Just add them to your plane! They come pre-covered to match the Cessna 182 ARF, but they can be used with most .40-size aircraft. Indy's foam-core floats are the fastest way to seaplane flying! The overall length is 32 inches; they weigh 21 ounces; and fresh-water displacement is 120 ounces.

For more information, contact Indy R/C, 10620 North College Ave., Indianapolis, IN 46280.

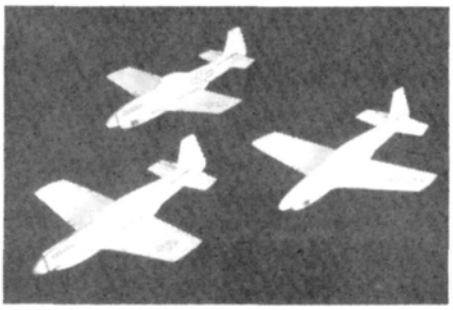


MIKE'S MODELS DUCTED FAN KITS

Mike's Models is pleased to announce its new line of ducted-fan model aircraft kits, the foremost of which is the stand-off scale Saab JAS 39 Gripen. This model is 66 inches long, with a wingspan of 42 inches. The fiberglass-and-foam kit comes complete with molded inlets, thrust tube, tail cone, all necessary wood, adhesives, hardware, full-size plans and complete instructions. Designed for 5-inch fan units and .60 to .80 engines, it weighs approximately 8 pounds. This aircraft will fly off grass and has excellent slow-speed characteristics. Its top speed to date is a moderate 130mph, using only a Rossi .61 for power with a Dynamax fan unit. The delta/canard configuration makes the aircraft very stable, and it has no nasty stalling tendencies.

For more information, contact Mike's Models, 4245 NW 114 Ave., Sunrise, FL 33323.

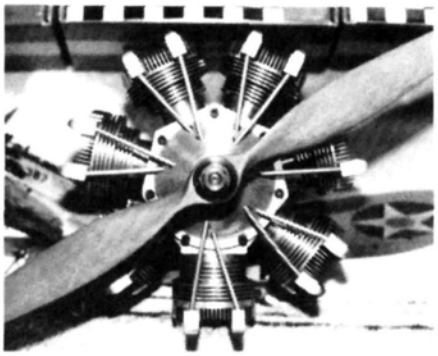
Descriptions of new products appearing in these pages were derived from press releases by the manufacturers and/or their advertising agencies. The information given here does not constitute endorsement by **Model Airplane News,** or guarantee product performance. When writing to the manufacturer about any product described here, be sure to mention that you read about it in **Model Airplane News.**



BILL LARRABEE WW II FIGHTER KITS

This kit of three well-detailed WW II fighter planes is the first in a new line of very durable, flying scale model gliders. Using high-quality card stock and laminated construction, the accent is on easy assembly and excellent flying. The kit includes a cutting board, a display stand and an assembly fixture to ensure the correct alignment of all parts. Well-written, well-illustrated instructions help to make building and flying a real pleasure.

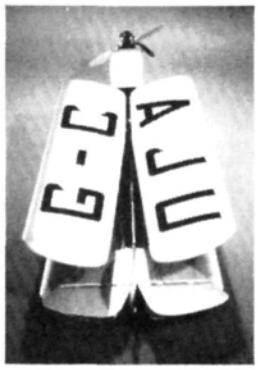
For more information, contact Bill Larrabee, Box 725, San Dimas, CA 91773.



WEST COAST ENGINES 2-STROKE RADIAL

West Coast Engines, the new owner of Dick McCoy's "The Real McCoy" product line, introduces a unique line of 2-stroke radial engines machined from bar stock. Unlike 4-stroke engines, these engines use no mechanical valves. The line will consist of .60-, .80- and .90-size engines in both 5- and 7-cylinder versions that feature ease of operation, high power, a built-in, muffled exhaust and a realistic look—all in a practical round engine for round-engine R/C airplanes!

For more information, contact Arlo Steinicke, West Coast Engines, 10771 Monte Vista, Ontario, CA 91762.



AERODROME MODELS CIRRUS MOTH

Biplanes have always had two things against them: first, the difficulties of transporting them in a small car, and second, trapping your radio. The Cirrus Moth solves both problems. Simply remove four easy-access bolts, and the wings fold, fully rigged, against the side.

To solve the radio problem, an easy-access panel has been installed in the bottom of the fuselage. The kit includes flying wires with custom brass hardware and scale control elevator and rudder hookup. The Cirrus weighs 6.25 pounds, has a 54 3/4-inch wingspan, it flies with a .45 to .50 4-stroke engine, and it has a wing loading of 17 ounces per square foot. This kit requires five servos with extensions for folding wings.

For more information, contact Aerodrome Models Ltd., 2623 S. Miller Rd., Saginaw, MI 48603

KRAFT MIDWEST TxCHECK

This unit can be used wherever many transmitters are in use and kept in an impound. The TxCHECK allows you to check that no transmitters are left on after being returned to the impound. It's a small, hand-held unit with a telescoping antenna powered by a dry 9V battery. If the TxCHECK detects an operating transmitter, it produces a high-pitched warning squeal. The case is made of black, high-impact plastic, and it's a pocket-size 4 1/4x3 1/4x1 1/2 inches. To test, press the push button and pass the antenna over the top of each transmitter. This unit is a must for safe operation at the field or in the pits.

For more information, contact Kraft Midwest Inc., 115 E. Northville, MI 48167.

FUTABA 7-CHANNEL PCM 1024 SYSTEM

The 7UAP 7-channel, PCM 1024 aircraft system provides accurate computer control for ATV, dual rate, exponential and mixing. Using data-input keys, all programming settings are made in 1-percent increments and displayed on an LCD screen. The 7UAP also uses Futaba's exclusive PCM 1024 for the ultimate in servo resolution and response. Flaperon and aileron differential, snap roll (4), programmable mixing, fail-safe and other settings are made, displayed and stored in memory for repeated flawless performances. In addition to programming functions, the LCD screen also provides information about servo-reversing, PCM/PPM switching, transmitter battery voltage and elapsed time of operation. Everything you need to know for a perfect flight is there, at the touch of a button—it even has an audible low-battery warning signal. The 7UAP system includes a narrow-band receiver that meets the 1991 specifications; The R129DP is also assembled using the latest SMT construction for super reliability, efficiency and compact size.

For more information, contact Futaba Corporation of America, 4 Studebaker Dr., Irvine, CA 92718.

HELI CHALLENGE

(Continued from page 111)

negative pitch, and if the nose drops, you need more positive pitch. (This setup is for beginners; as you get more proficient, you might want to increase negative pitch to help you to hit your landing spot.) For now, we want the helicopter to descend flat through the entire auto.

"When you've tried a few mock approaches, you'll realize that the helicopter becomes a glider when the throttle is reduced to idle, and forward speed can be controlled by fore and aft cyclic control. Try a few descents to around 40 feet, and power out of them to recover. On the way down, try varying the forward speed, and notice just how slowly the helicopter will float down. Be sure that you don't use the hold switch yet. Keep practicing these descents until they're fun and are no longer nerve-racking.

"Now that you're comfortable with the practice descents, allow them to get lower (down to around 15 feet or so), and get used to that. Now practice using the throttle-hold switch. Begin the descent by fully reducing the throttle to idle. When the helicopter enters the descent, flip the hold switch. Abort the descent at around 40 to 30 feet by first flipping the hold switch off and smoothly increasing the throttle to fly out. If you flip the switch after the throttle has been opened to above hover, you might discover that the helicopter will do some things that you *didn't* know it could do. (You might also need a hard hat and goggles to avoid injury from flying debris, like main-rotor gear teeth and other pieces!)

"Practice, practice, practice, until you're completely comfortable with the bail-out from lower and lower altitudes. When you're below 10 feet, you'll be ready for full-down autos. Remember to plan your approach so that the machine is past you at the bail-out if you don't fly nose-on. If it looks as though it won't make it past you, power up and go around. You'll discover that autos will be easy to do, and I think anyone can do them. Just try to be patient when practicing, and try not to panic if you get into trouble.

"If you want to learn to touch down, try this: With the chopper on level ground and nose its into the wind, ease up the throttle stick until the machine gets light and, just before liftoff, hit the hold switch. Ease the collective stick up, and watch as the machine rises to a hover inches off of the ground and then returns slowly to land—like a butterfly with sore feet! As

(Continued on page 129)

Golden Age o

by HAL "PAPPY" deBOLT

GENERALLY, MAJOR EVENTS are what make "history," but what happens at the local level is also a major cause of progress, even though these events might not be earth-shattering. Many of you might have played a vital role in the growth of R/C, so why not share the information?

Jamestown Journal

My plea for info was prompted by a letter from an old friend—R.C. "Doc" Gulvin of Frewsburg, NY, who has been active in the Jamestown R/C group for as long as I can remember. Retired now, he still enjoys R/C and has 22 planes of every description! Doc reminded me of the high level of interest always shown in R/C in this small, country town of Jamestown, which is about halfway between Buffalo, NY, and Erie, PA. Action there grew from the time of "rudder only" to the present day, and amply illustrates R/C growth (helped a lot by a group of mighty fine modelers).

As is often the case, strong leadership was instrumental, and in Jamestown, that was provided by the late Howard Dart and his two sons, who were avidly interested in both full-scale and model aviation. The Darts always managed to do something different with R/C, and this is what probably put this town on the R/C map.

R.C. "Doc" Gulvin, of Jamestown, NY, with a '50 Smog Hog—one of 22 models in his stable. Jamestown was a hotbed of R/C for years.

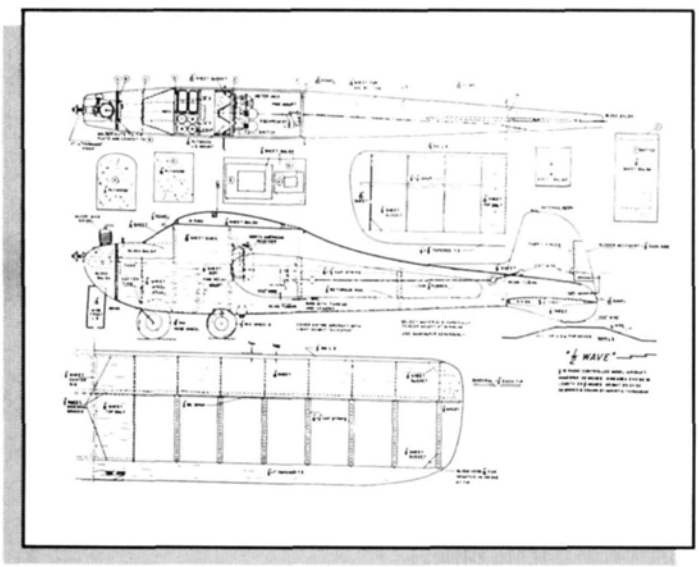
Howard Dart realized the attraction of full-scale air shows and the daredevil displays of aerobatic "teams." (Today, we have the Christen Eagles, the Blue Angels, the Thunderbirds, the French Connection and a host of others.) The three Darts went about demonstrating the viability of *R/C* air show teams. Their team flying was done in the days of Space Control, and they used the Babcock Breezy Jr. for its simplicity and maneuverability when intentionally over-powered. With their version, the S.C. "red brick" could be switched between planes in minutes, and this was most important to keep the show going smoothly!

The show began with a single pass of down-low, close-in aerobatics (the name of the game being "how low can you go?"). This was followed by formation aerobatics with three planes, and, with practice, the Darts got this down to a fine art. As you'll no doubt be able to imagine, the show-stopper was an exhibition of *combat:* chasing (and often catching) each other's streamers. The Dart's show was outstanding because it was performed within an area that was the size of half a football field, and they radiated their enjoyment! The show wasn't confined to Jamestown; an invitation from anywhere in the area would bring them out. Remember, this was the early '60s, and the Darts probably inspired what we see today.

Ghost of the past? Yes! Tom Massopust's first L.W. Trainer climbs away in West Allis, WI. F&M radio; single channel; 1960.

With that daredevil flying, the rate of model attrition was high: "Breezys" often had to be replaced quickly. Before we had film covering, it took time to dope the silk then used on R/C birds. The Dart's solution was a *drum of dope.* They simply dunked parts in the drum and then hung them up to drip-dry! The result was far from pretty, but expendable airplanes have little need for good looks!

The Darts developed another approach that was as unusual as it was successful. They "squared off" the Breezy fuselage and bent wings out of sheet aluminum! With these, they were able to "bump out"



Old magazines are gold mines of OT R/C info. From 3/54 MAN, Harvey Thomasian's ½ Wave—one of the first ½A R/C designs.

Chet Lanzo's R/C scale Stinson '50s. Nats flight was aborted with an engine on fire! Chet still has model in storage.

the dings quite easily, à la an auto-repair shop! It's puzzling that their success didn't inspire more all-metal R/C planes.

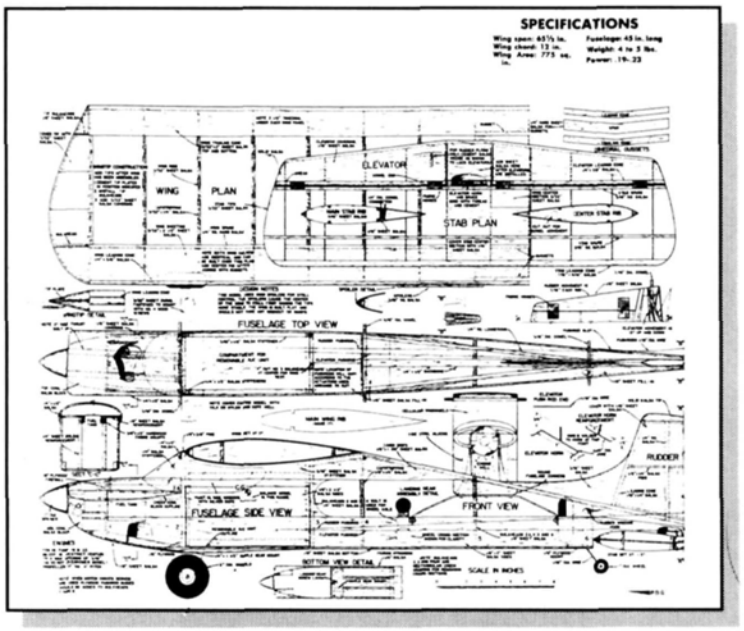
The Darts' enthusiasm in promoting R/C modeling led to a more lasting accomplishment: In the '60s, pylon racing showed itself to be exciting for competitors and spectators, and, as this type of racing spread across the nation, Western New York wasn't immune to the excitement. Initially, most of the area clubs sponsored a yearly race, so there was plenty of action. Then, one year, a couple of clubs dropped out, so fliers were short of races. Howard Dart was the first to realize that the enterprise needed organizing, and he suggested a "circuit" like that used by auto racing and boat racing.

His idea bore fruit when six clubs in western New York and Canada formed the United Pylon Racing Circuit. Two classes would be flown: traditional Formula I and Sport Pylon, which was to be an *entry-level* event allowing *any* model that met the required minimum size to compete. Additionally, since the purpose was to entice newcomers into the circuit, only "sport" engines would be allowed (rather than the *all-out* engines being used in Formula I). Further, modelers not only flew to win and have fun, but to also accumulate points toward the annual Championship, which, with its awards banquet, was the culmination of each season's activity. Such an organization offers so much more than happen-stance events do.

Now, 17 years later, the activity of the UPRC is greater than ever, but it's difficult to find any of the original group still racing. In recent years, FAI Pylon has been added to the agenda with the hope of increasing U.S. and Canadian participation in this World Champ event.

Like so many other good modelers, Howard Dart left us all too early. Son Bob went further into full-scale aviation with his Hatfield Airport (NY) operation, and he shows his continued interest in the UPRC by offering his airport for one of the yearly races.

R/C modeling needs more people like the Darts and the Jamestown group. I know there have been and are more people like them. How about you? Do *you* have a tale to tell?



In 1953, Hal deBolts's Over and Under opened the door to inverted R/C aerobatics. Schmidt "reeds" and K&B .19 power.

very well attended and a joy to be part of.

Tom recently lent me a box of magazines from the '50s and '60s—a heavenly box of goodies that took me two months to review! What a gold mine of OT R/C information! There's no way I can pass on all the information reviewed, but I suspect there are more "Toms" out there with great collections. I found many original articles covering famous models, and, to help you, I'll list what this relatively brief search found. All these models would be attractive today. The magazines are the now-extinct *American Modeler*, and this list shows month, year, model and designer.

6/54: Monster Amphib—McGovern

2/57: Barnstormer Bipe—J. Luck

3/57: TTPW Radio—Good

3/58: Fokker D-8—Cal Smith

6/58: Great Lakes Trainer—Northrop

8/59: Crusader Low Wing—deBolt

1/60: Charger—Boone

6/60: Fleet Bipe—Neukom

3/63: Sultan—Nelson

3/63: World Champ Reb—Brooks

7/65: Citron—Kirkland

Of great interest is the thought behind each design. In the light of present knowledge, the reason why something was done in a particular way is often amusing. I'll give you some examples:

Which was the first plane to perform inverted maneuvers? I claim this honor with my Over and Under design in the July '54 issue of *Air Trails* magazine. I

(Continued on page 141)

On Cloud Nine!

Tom Gealta of Tampa, FL, is an enthusiastic OTer from way back, and he has a workshop loaded with models of every vintage. You may know that the AMA's "Cloud 9" is its connection with OT modelers, but you might *not* know that Tom is the one who organizes the yearly Cloud 9 banquet at McDill AFB. This is always

PHOTOS BY ED WESTWOOD

by ED WESTWOOD

WESTON SEA ERA

An exotic-looking amphib that incorporates some unique design and fabrication techniques

LOOKING LIKE A Giugiaro design with wings, when pushed with a .90, this sandwiched-foam/glass seaplane is 11 pounds of raw power, but it still makes a gentle landing. I've flown a few seaplanes, but for pure exhilaration, Paul Weston's* sleek pusher is top of the line.

I met Paul at the ERMA Spring Float Fly at Lake Goodwin about four years ago. He had brought his Slam Dunk—a HP .40-powered tailed delta pusher—which, once off the water, did about 90mph and absolutely mystified the crowd.

The following year, Paul returned with his Whip Lash—a .90-powered pusher with a cranked delta wing. This machine, though somewhat slower and easier to handle than the Slam Dunk, wasn't the 1/4-scale model of the full-scale seaplane Paul wanted to build, since the flaperons tended to invert the machine occasionally while landing. The thought of having to upright an inverted ship made Paul seek further improvements. He added conventional 15-percent wings with real flaps to the rear of the blended delta fuselage and that's how the Sea Era evolved.

When Paul showed up with the prototype, we all marveled at his construction technique: strip balsa over a

frame, and glassed inside and out. He said that he hadn't had time to paint; *we* said he *never* should! Construction *that* beautiful shouldn't be painted, so it flies today like a strip-built canoe—but with wings. This howling pusher performs most pattern maneuvers, including a respectable knife-edge.

With his mold-maker, George Stroud, Paul took 22 patterns off the prototype and asked me if I'd assemble the first all-glass production model. What could I say? We're friends!; but I'd only built several 1/48-scale plastic models and had *never* built a glass machine. Not to worry, said Paul; neither had he! Well, the combination of his encouragement and my perseverance made up for my lack of expertise, and the first ship took shape. I wrote the construction manual as I built it: step by step. I developed some interesting assembly methods, probably nothing new to the world of glass modelers, but new, at least, to me.

ASSEMBLY: Compared with a conventional ship, it probably takes more patience, but no extra talent, to assemble the Sea Era. Particular attention must be paid to assembly sequence, however, since the inside must be completed before the shells are joined. The molded shells consist of 1/8- and 1/16-inch-thick foam sandwiched between layers of 3-ounce epoxied fiberglass— a combination that produces a very strong, light, monocoque structure. Carbon-fiber tow is used to reinforce high-stress areas like the tail boom. An interior skeleton of interlocking lite-ply bulkheads and longitudinal keel members provides support for 3/4-inch i.d. phenolic tubes that carry plug-in 6065 T-6 o.d. wing tubes, canopy sills and servos.

The alignment of the wings on the fuselage is logical and must be *precise*. Assemble the wings by epoxying pre-formed, glass, leading-edge doublers to the lower shells, then align and secure the lite-ply ribs and spars. The foam trailing edges are epoxied to the lower wing panels and beveled slightly to match the upper shell's trailing-edge angle. Don't join the tops yet. Align the phenolic outer wing tubes by inserting two lengths of 3/4-inch-i.d. PVC pipe in the phenolic fuselage tubes, and block them so that they're at precisely 90 degrees to the fuselage wing root. These are then epoxied into place. With their phenolic tubes inserted, the wing panels are slid onto the PVC pipes, blocked for alignment, and epoxied. This is done *before* the fuselage and wing upper shells are secured.

The canopy should be tinted with hot Rit dye before it's joined to the sills, which, in turn, are temporarily screwed to the upper fuselage shell during alignment and final assembly. Since the canopy must be assembled from the inside,

SPECIFICATIONS

Type: *1/4-scale pusher seaplane amphibian*
Wingspan: *66 inches*
Length: *65 inches*
Weight: *11 pounds*
Power: *.90 2-stroke, 1.2 4-stroke*
No. of Channels Req'd: *5 (seaplane only); 6 as amphibian*
Sug. Retail Price: *$575*
Features: *Plug-in wings, complete dash, front and rear seat, fuel tank, all hardware, glass-cloth, clear canopy and side windows.*
Comments: *The best-looking seaplane on the market. Looks good and flies well.*

Lower fuselage shell with wings clamped into place to ensure alignment of phenolic joining tubes. Note carbon-fiber tow in tail section.

Inside upper shell before joining. Engine-control mini-servo already installed.

all this should be completed before the fuselage shells are epoxied together.

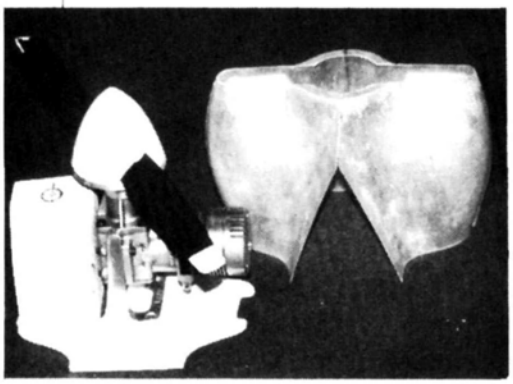
The joining of the fuselage shells is a three-person task! When the canopy, control rods and antenna tube have been secured, two rectangular holes are cut in the upper shell opposite the aileron and flap pushrod exit sleeves. The rudder pushrod sleeve hole is then drilled, and the engine fire wall and fuel tank rear base-plate are glassed into place. The throttle servo and forward tank-support cross-member are also installed at this time. Of course, we joined the two shells several times, checked for fit, and trimmed where necessary. The upper shell is positioned over the interior structure, and the bulkhead positions are marked with a water-soluble felt-tip pen; the shell is then removed and the marks transferred to the inside surface of the shell.

In two containers, prepare about 4 ounces of epoxy mixed with enough micro-balloons to make a mixture the consistency of thick pancake batter. This is where the two helpers come in handy! While one of us cut 6-inch lengths of glass-fiber strapping tape, the other two daubed the thickened epoxy along the marks on the upper shell's inside edges and exposed frame edges on the lower shell. The shells were then joined, aligned and taped together, and the entire assembly was inverted on a foam pad to ensure that the epoxy stayed on the joints.

Check the tail boom to see if it's vertical. (I used an extra piece of long strapping tape to pull it into vertical alignment after loosening and re-tightening some of the short pieces.) The wings, horizontal stabilizer and vertical-fin extension should be assembled in the same way.

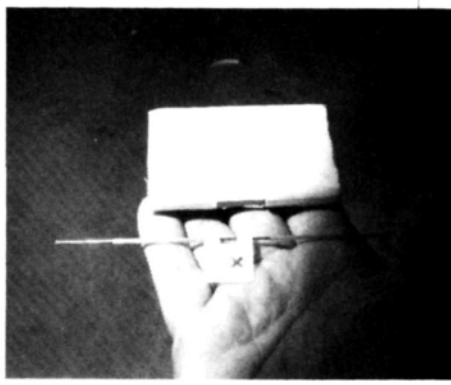
The control surfaces and flaps are glassed after trimming them to the plan sizes, and the leading edges are beveled after you add the Sullivan pushrod inner-sheath hinge tubes. Since the foam is waterproof, the ailerons, flaps and upper rudder ends don't have to be glassed. Adding the "balance ears" to the elevator took some extra work, then it was glassed also.

After sanding and applying a final coat of epoxy, prepare the hinge slots by cutting out pieces of the Sullivan rod opposite the hinge positions. Slip Sig* Double XX hinges into the slots, and insert .039 wire through the ends to act as hinge pins. Then the opposite trailing edges are slotted and the control surfaces are mounted. (Vertical adjustment was made by slightly enlarging a couple of the slots.) Align the hinges, epoxy them into the foam trailing edges, pull out the pins and clean off all excess epoxy. Some finishing work around the wing-control pushrod exit holes and stabilizer saddle completes the fuselage, and the ship is then ready for surface preparation and paint.

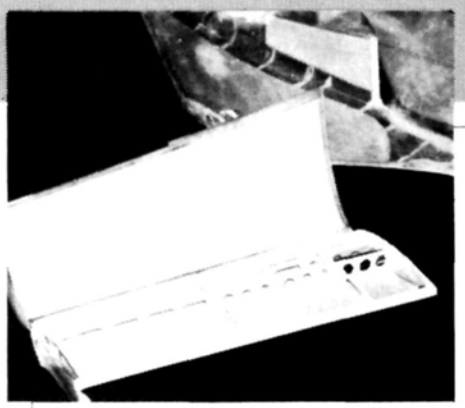


ST 90 with mock-up muffler beneath J-Tech aluminum mount. Author used stock muffler with copper "street L" as diverter.

Fin with rudder attached. Pad is drilled and tapped for 10/24 nylon hold-down screws. Note water- rudder recess.

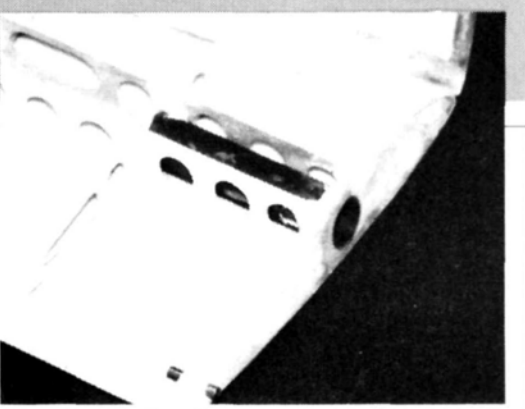


Sliding .039 wire down rudder leading-edge ro to engage XX half-hinge embedded in fin.



Wing ready for upper shell joining.

Wing-fit check. Note 8/32 tie bolt and alignment pin-tube backing block.



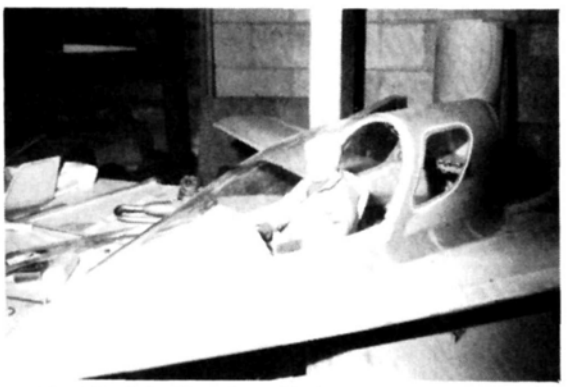
Phenolic-tube installation sandwiched in minimal lite-ply internal structure. Note alignment tube at trailing edge.

Bob Violett* pin-hole filler will take care of the few small holes that you'll invariably find in glass panels. I painted the ship with two coats of flat-white Super Poxy*, mixed in equal parts with thinner, and, of course, I sanded with very fine wet-or-dry between coats. I used MonoKote* trim, and then shot the whole ship with clear-gloss Super Poxy.

RADIO INSTALLATION: My 7-Channel Futaba* was installed according to the plans using Z-bends at the servos. Control throws were as follows: low-rate elevator, 1/4 inch up and down; high rate, 1/2 inch; rudder, 1 inch on high rate; ailerons, 1/2 inch up and 3/8 inch down; and flaps, 45 degrees for full down.

ENGINE INSTALLATION: Position your chosen mount (I used an O.S.* 60 SF and an ST 90), and drill the appropriate holes. I added silicone rubber to the mounting surface and secured it with 8/32 Allen-head bolts and locknuts. The tank is held on the tank plate with rubber bands and wedged securely into place with foam rubber.

Next, hook up the pre-positioned throttle mini-servo and check it for full-throttle operation and cut-off. Incidentally, the tank tubes face forward to ensure that the engine won't starve during a climb. Since the muffler must be reversed, I re-positioned the fuel-tank pressure tap and bonded a 1/2-inch copper sheet "L" to the forward-facing muffler exit as an exhaust diverter. With the O.S., I used a reversed 12/6 Zinger*. Since the ST 90 could be reversed by rotating the front frame 90 degrees counterclockwise, I trimmed a standard 14/6 Master Airscrew* by 3/16 inch and installed it. In flight, either combination produces the distinctive "pusher" sound caused by the prop cutting the turbulence caused by the forward fuselage section.



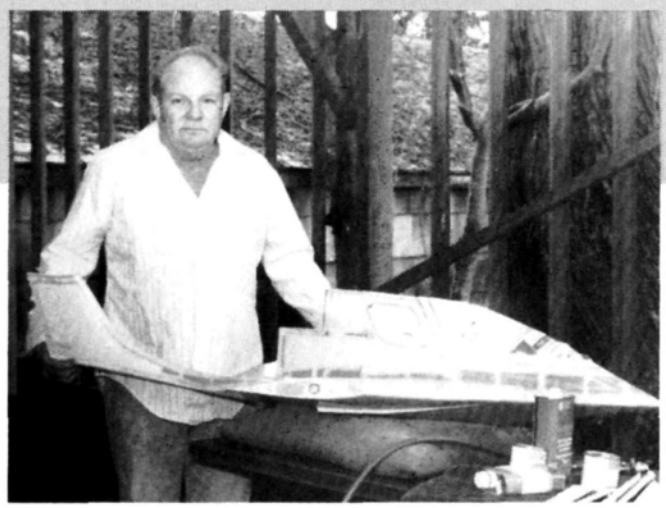
Yes, Virginia, there is a pilot!

PERFORMANCE: Since this ship is so clean, I flew it easily with the O.S. 60 long-stroke. It didn't have the acceleration and vertical performance that a .90 provides, so I switched to the reversed ST .90 to match Paul's prototype configuration.

The Sea Era *isn't* for the faint of heart! Takeoffs are really skate-offs unless the water's rough. Full-aft stick on low rate with no (or very little) flaps gets it planing on its hydroplane hull, and it lifts off all by itself. Rough-water takeoffs require slightly more aft stick, and the ship tends to porpoise occasionally, but the power usually just manages to launch the ship before too much water drag occurs. The Sea Era can perform most pattern maneuvers, including a respectable knife-edge, and it performs one maneuver that I've never seen before: the multiple Lomcevak. Pull it straight up, then push both sticks to the top insides, and it's an airplane gone mad! Neutralize, and you're back in the civilized world again.

Landings are smooth, but slightly too fast, and this is where the flaps help. Full flaps, hold it a few inches off the water and wait. When contact is made, release the elevator and the Sea Era skates to a stop. Taxiing is rather unusual in that on the step, the ailerons are used to drag a tip in the water which pulls it around. The rudder is strictly for displacement steering, takeoffs and occasional maneuvers.

After several hours of testing, I've found that a little water occasionally gets in because of splashing around the canopy, so I leave several sheets of paper towel inside to soak it up—



The author with Sea Era prior to painting.

no problem!

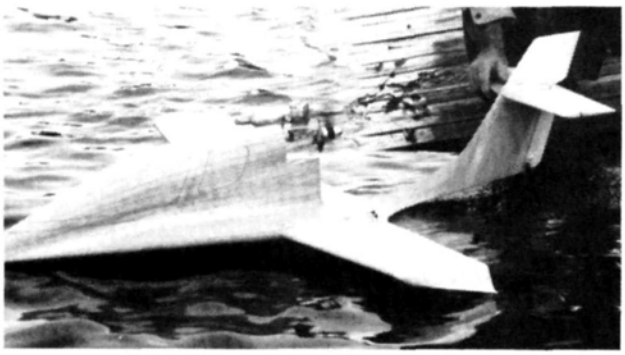
The Sea Era is amazingly durable. I've dropped it from several feet, stalled it and slammed it down, and I even cartwheeled it once on an inadvertent cross-wind landing. It hasn't sustained *any* damage! I'm not saying you couldn't destroy one, but you'd really have to work at it. As John Sullivan says, "If land was only as hard as water, pelicans would be diving for gophers, too."

**Here are the addresses of the companies mentioned in this article:*

***Paul Weston Co.,** 4214 West Lake Samamish Pkwy NE, # 306 Redmond, WA 98052.*
***Sig Manufacturing Co.,** 401 S. Front St., Montezuma, IA 50171.*
***Bob Violett Models,** 1373 Citrus Rd., Winter Spring, FL 32708.*
***Super Poxy;** distributed by K&B Manufacturing, 12152 Woodruff Ave., Downey, CA 90241.*
***MonoKote;** distributed by Top Flite Models, 2635 S. Wabash Ave., Chicago, IL 60616.*
***Futaba Corp. of America,** 4 Studebaker, Irvine, CA 92718.*
***O.S./Great Planes Model Distributors,** 1608 Interstate Dr., P.O. Box 4021, Champaign, IL 61820.*
***Zinger;** distributed by J&Z Products, 25029 S. Vermont Ave., Harbor City, CA 90710.*
***Master Airscrew;** distributed by Windsor Propeller Co., 384 Tesconi Ct., Santa Rosa, CA 95401.* ■

Sea Era...Worth the Wait?? *by JOHN SULLIVAN*

IN MAY '88, Paul Weston's prototype Sea Era made its first public appearance at Clearlake. Pilots and spectators alike were stunned by the plane's performance. With its flaps down, the Sea Era had the ability to saunter by with some of the slowest, yet, with its flaps up and its 2-stroke .90 strung out to the limit, this modified delta was capable of blistering speeds few of us had ever seen in a floatplane. Then there were the aerobatics: big loops, small loops, plenty of vertical punch, tight axial rolls from one extreme of the flight line to the other, hammerheads, snaps, Cuban-8s, and something I'd never seen before—triple Lomcevaks! But the truly amazing characteristic commented on by everyone who flew it (including yours truly) is that this thing is actually *easy* to fly! The option is entirely yours: Rip up the clouds or putt around like grandpa; the Sea Era can take it.



Two aspects of the Sea Era might be overlooked in the usual type of review: the amount of development time spent on the project by its designer, Paul Weston; and the incredible quality he puts into each kit. As early as the spring of '87, I began hearing of the Sea Era's development from my good friend Ed Westwood, of Spanaway, WA. After six months and two early prototypes, I began to realize that this guy Ed was writing about, Paul Weston, was either half-crazy or unwilling to accept anything less than perfection.

Then the videos started arriving—three in all. Refinement and, in some areas, redesign was evident, for by the third video, it was apparent that a totally new airplane had evolved.

This brings us up to May '88, when Paul flew the Sea Era at Clearlake. At the same time, Paul announced that he intended to kit the plane and have it ready within "a couple months." A local flier, Bill Curry, expressed interest in buying one of the first kits. Curry waited *13 months* while Paul slaved over molds and production details, but it was well worth it. The quality of the glassed parts is nothing less than exquisite. You'd swear you were looking at the components for a Jarvic artificial heart rather than parts for a model airplane—they're *that* good!

Kudos to Paul Weston. He has avoided every pitfall associated with a new kit offering by refusing to settle for less than the best. There's still a bit left for the builder to do, but once completed, the Sea Era will give you an exciting alternative: lighter and cleaner (and yes, more expensive) than a North Star, with twice the power; an amphibian that can smoke or simmer—or anything else in between! ■

HELI CHALLENGE

(Continued from page 120)

you practice this, try to get the skids approximately 6 inches off the ground and hold them there by slowly adding collective. As the blade speed decays, the helicopter will settle back to earth like a feather. With a little practice and a slight breeze, you can make the helicopter hover for 5 to 10 seconds and have fun doing it! I call these 'mini autos.'

"When you feel comfortable, start increasing altitude. Lift off into a hover at about 1 foot, or less, and when the hover is stable, hit the hold switch (you'll have to hold the tail rotor slightly to keep the nose into the wind).

"Increase the collective again until the helicopter settles smoothly back to earth. Try going up to around 3 or 4 feet, and practice these until you're comfortable. You can get a little higher, but there's a point at which the helicopter begins to get a little shaky. At this point, begin your flare when you're doing full-down autos.

"The flare is the last, and most critical, area in learning about the auto. A few things must happen, and they must all happen near the ground at about the same time. To put the helicopter into a touchdown attitude, flare the helicopter by pulling back on the cyclic and adding collective pitch at about the same time. Pulling back on cyclic actually slightly increases rotor speed, and this is the result of converting whatever forward energy the helicopter has into rotor speed. It also stops the forward motion of the helicopter and makes it easier to touch down. Adding collective pitch allows the energy stored in the spinning rotor head to be converted into lift. This softens the impact with the ground, just as it does when adding collective before a normal landing, but we rely on inertia to provide power during the autorotation, and the engine supplies the power for a normal landing.

"To simplify it, we can approach the flare in two stages, and as you get better, you'll actually be performing both functions simultaneously. First, pull back on collective to stop forward motion; second, add collective to generate enough lift to soften landing. Think of these as two distinct steps, and you'll have no problem with your landings. *Don't* start the flare too high; shoot for a start at around 3 or 4 feet off the ground.

"Let's go over the whole process and put it all together: Start with the helicopter at around 75 feet, downwind, in very slow forward flight, moving into the wind. Make sure that the helicopter is at a point

(Continued on page 130)

HELI CHALLENGE

(Continued from page 129)

where it will drop to a spot directly in front of you or just past you. Smoothly reduce the throttle all the way to idle. When the helicopter is in a flat descent, hit the throttle-hold switch. Allow the helicopter to descend to around 3 or 4 feet, and start pulling back on cyclic pitch to stop all remaining forward motion. Feed in collective pitch to soften the landing, and try to hold the helicopter 1 inch off the ground by adding even more collective until it settles softly. Repeat this until you've mastered the process, and remember to have fun. When you're really good at it, try some spiral dives and turns on the way down, and above all, practice, practice, practice."

You heard it here first! ■

CONCEPT 30

(Continued from page 93)

up, throttle-down, adjust-the-needle sequence about three times until we got the high end just where we needed it. We rechecked the main-rotor tracking and then prepared to get airborne. Nick Ziroli did the test hop, and, after just a minute or two of flying, he commented on just how nice it was to fly. It required two clicks of "aileron" and a slowing down of the gyro response rate and nothing else!

Nick Jr. tried it next, since he had his own Jet Ranger-bodied Concept on hand for comparison. He said the machines handled nearly the same, but mine perhaps had a slightly slower control response, and he attributed this to control set-up. I was fascinated by the machine from the start, and I just *had* to try it, so we attached the "training gear" with Zip ties, refueled and fired up.

I was still a bit nervous about this whole thing, so I asked Nick to see if the Concept needed to be re-trimmed, since we had added the training gear. Nick powered up and hovered the Concept, and he took his fingers completely off the sticks for a number of seconds. The stability was amazing, and it was interrupted only by an occasional increase in the wind. Looked easy to me, so, after setting it down, Nick offered me the transmitter and I was on my own.

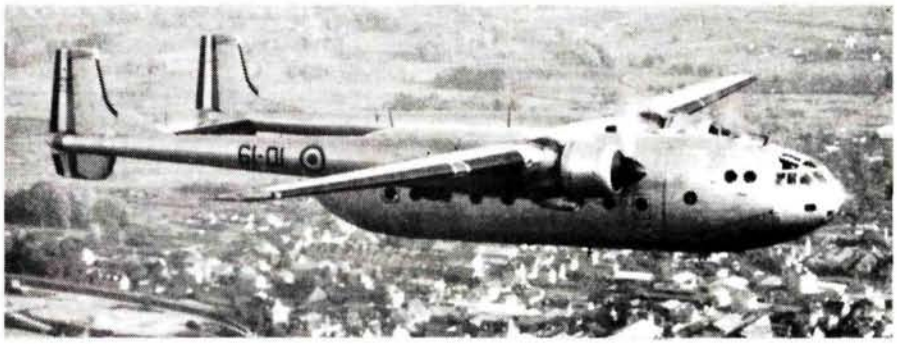
After the usual sliding it around sideways on the ground, anticipating that it would be going UP at any moment, I managed to coordinate enough tail rotor to keep the nose pointed away from me, and I added power to the point where it

(Continued on page 135)

NAME THE PLANE CONTEST

CAN YOU IDENTIFY THIS AIRCRAFT?

If so, send your answer to **Model Airplane News**, Name the Plane Contest (state issue in which plane appeared), 251 Danbury Rd., Wilton, CT 06897.



CONGRATULATIONS to Mitchell Dudnikov of Baltimore, MD, for correctly identifying the French Potez Type 75 shown in our August issue. Mitchell's name was drawn from the 17 correct answers received. This was one of those you either knew or didn't, as it would be difficult to confuse it with any other airplane!

Traditionally, most aircraft developed for the ground support, or "mud-fighting" role lack esthetics, being purposeful rather than "pretty"—witness the WW II Ju-87 Stuka and Shturmovik and the current A-10A T-Bolt II. The Potez gives away nothing in the "homely" department! The prototype first flew on June 10, 1953, and it accumulated over 500 flight-test hours before being committed to production for the French Army in 1956. The original order was for 15 pre-production and 100 production-configuration airplanes. The unusual twin-boom, pusher-engine layout used a 480hp inverted V-8, and the crew of two was surrounded by armor, the front cockpit housing the observer/weapon-control operator. The pilot, however, might not have been quite as comfortable in adverse weather, as his "office" was an open cockpit!

Typical of ground-attack design philosophy, the Potez traded speed for payload with a Vmax of 170mph and a disposable load of 1,307 pounds. Of all-metal structure, the Potez spanned nearly 43 feet, was 29 feet long and carried a large-caliber, automatic cannon in its nose. ■

The winner will be drawn four weeks following publication from correct answers received by postcard delivered by U.S. Mail and will receive a free one-year subscription to **Model Airplane News.** If already a subscriber, the winner will receive a free one-year extension of his subscription.

CONCEPT 30

(Continued from page 130)

lifted off. It did this enough times for us to see that I was really *fighting* the controls rather than just letting the machine fly, so I relaxed a bit on the sticks and concentrated on anticipating what the Concept would do as a result of my control inputs. Thinking ahead of yourself and the machine sure helps! I ran out of battery toward the end of the fourth flight (fortunately, I was only inches off the ground at the time), and since I didn't have any of the three things I mentioned earlier in this report, we considered it a successful day. We packed up and I went home elated: I didn't need any new parts, and I'd managed to hover the machine, albeit not for long, on the first time out. That's not a testament to my ability as much as it is to the design of the machine itself. And remember, mine is the performance SE version. I can only guess that the DX might be even easier.

I'm still flying with the training sticks as I approach the 3-gallon mark, but I can now manage to hover and position the Concept reasonably close to where I want it. The flying ability of the machine in the hover, forward flight, aerobatic and autorotation modes has been demonstrated by others who have flown mine. I'm now confident that the machine is everything I'll ever need it to be, and it will serve me well as I progress through various levels of competency. Heli flying presents a tremendous challenge, and it's very satisfying to accomplish even the simplest feats.

The Concept 30 will probably do more to entice new fliers from both fixed-wing and "no-winged" camps to try heli flying. Kyosho's U.S. distributor, Great Planes, seems committed to making this happen by making spare parts readily available through them and their large dealer network. In addition, they've established a Heli Support Line (217-398-2834) that's staffed by people who know the product and can offer assistance to Concept builders and fliers. This is a great move that will certainly increase the success rate of R/Cers just getting into helis.

It's difficult to find anything wrong with this helicopter. Maybe I'm not experienced enough to recognize problems, but if that's the case, who cares? I've spoken to many accomplished fliers who unanimously say that the Concept is a great machine. Their other comments usually focus on "things I'd like to see," personal preference items, but no one faults the machine as sold. It's hard to

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Wanted:

AUTHORS CONTRIBUTORS PHOTOGRAPHERS

We think a lot of our readers have ideas that are worth sharing. How many times have you read an article and said, "I could do that!" or "That's not the only way to do that; mine's easier!" Could very well be! Here's your chance! We'll be expanding **Model Airplane News** and are looking for additional contributors to help us accomplish this objective. Of key importance is the ability to take good photographs; the writing we can help you with. Interested? It's much easier than you might think.

Let's hear from you. Send in your ideas, articles, thoughts and photos; we're looking forward to it.

RICH URAVITCH
MODEL AIRPLANE NEWS
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Classified

WANTED: Model airplane engines and model race cars made before 1950. Jim Clem, 1201 E. 10, P.O. Box 524, Sand Springs, OK 74063; (918) 245-3649.

SCALE DOCUMENTATION: Plan Enlarging. Photo packs, 3-view drawings for 1,600 aircraft. Super-scale R/C plans for Giant, Sport. 80-page catalog $4. Scale Plans and Photo Service, 3209 Madison Ave., Greensboro, NC 27403; (919) 292-5239.

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CONCEPT 30

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stack the cards against something that has been so successful; the Concept is well engineered and accurately produced, and it performs well. Forget the fact that it's less expensive (both initially, and for spare parts), more economical to operate, and its size makes it "cute" and probably less intimidating to beginners. This is a good machine that's likely to be around for years.

I plan to use the Concept as the vehicle for some of the add-on accessories that Kyosho will be making available. In order to let other beginner heli fliers know how I'm doing, I'll be flying it extensively, because I think there are a lot of us out there. Kyosho has seen to that!!

**Here are the addresses of the manufacturers mentioned in this article:*

Hobby Lobby International, *5614 Franklin Pike Circle, P.O. Box 285, Brentwood, TN 37027.*

Kyosho; *distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.*

Futaba Corporation of America, *4 Studebaker, Irvine, CA 92718.*

O.S.; *distributed by Great Planes Model Distributors, 1608 Interstate Dr., P.O. Box 4021, Champaign, IL 61820.*

Hirobo; *distributed by Gorham Model Products, 23961 Craftsman Rd., Calabasas, CA 91302.*

Hobby Poxy Products, *36 Pine St., Rockaway, NJ 07866.* ■

QUIET FLIGHT

(Continued from page 113)

can cover lots of ground when you *need* to, or slow down for some relaxed flying when you *want* to. One thing I do like about the Harlequin is that it's very tough! I've had two or three inverted landings owing to wind gusts, and so far, no damage has occurred.

"I don't have much time to spend on the E193 wings. Although they're harder to build, I prefer them: Their penetration seems better, probably because of the thinner airfoil. The undercamber in the E193 allows the ship to slow way down, and that's more in harmony with my flying style. The L/D is excellent with the E193; I think it's even better than the modified E205."

Since receiving George's letter, I've talked to him on the phone. Although he didn't say it in his letter, George told me that he really saw very little, if any, difference in the thermalling ability of one section compared with the other. The main difference was in penetration ability at high wind speeds, but under more "normal" conditions, it seems that most of us wouldn't notice much difference in performance.

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QUIET FLIGHT

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I think that once you get into the same performance range of airfoils, the differences are slight. The real differences show up when you make a change from a flat-bottom to an Eppler performance foil. If any of you have tried a similar experiment, please share your experiences with the rest of us. I hope George finds time for the S4061 wings, since they're supposed to be an improvement on the E205. It would be interesting to see if he can detect a difference in the two sections under actual working conditions. Thanks for the time and effort, George!

Winsome Update

Larry Jolly recently finished his Winsome prototype, and I saw it fly at a club contest. The Winsome has turned out to be a very good-looking ship, with the general appearance of an F3B model, but Larry says it's designed as a thermal duration model.

The vital statistics of the finished model are: span, 124 inches; area, 1,100 square inches; weight, 90 ounces; wing loading, 11.6 ounces to the square foot; airfoil, Eppler 374; aspect ratio, 14:1; functions, rudder/elevator/flaps/ailerons/spoilers. The model tracked well on launch and went up just as a lighter ship would. I think this is partially due to the lower-drag Eppler 374 airfoil, as most 90-ounce models put a lot more strain on the winch than did the Winsome.

Larry was the last in his flight group to launch. He entered the same thermal as the other competitors, but at a lower altitude. After only a few turns, Larry was at the same level as the rest of the models; after a couple more turns, he was *higher* than the rest! When it was time to head for the spot, Larry pushed the Winsome into a dive and descended very quickly. Then, by using the flaps and spoilers together, he was able to bring the Winsome

CLUB OF THE MONTH

ALABASTER R/C ASSOCIATION

IF YOU'RE A MEMBER of the Alabaster R/C Association in Birmingham, AL, you're not only a *very* busy person, but you're also a member of *MAN's* October '89 "Club of the Month." Congratulations to a club with an exceptionally busy event schedule and one of the best newsletters to come our way in a while.

New member David Liberman, editing his *first* issue of "Crosswind," exhorts all members to send in a contribution to the newsletter, and he passes on this advice in his "Hot Tips" column: "Ever lose your plane...spend two hours combing through tall, plane-eating weeds, just to discover you passed within 10 feet of it two or three times?" He says you can speed this process by carrying your transmitter, constantly wiggling the transmission sticks, and listening for the servos. Apparently, "those servos can be heard squeaking 10 or 15 feet away." He adds that you should notify other fliers and take the frequency pin before doing this.

President Joe Griffith reminds members about the Fun Fly on October 1st at Leeds: "Last year, we did make a showing (they knew we were there!). We did give them a little competition. This year, we want to knock their socks off and come home as winners." Fighting talk!

An amusing account of the club's July 14 Second Annual Redneck Sailplane Fun Fly shows just how successful the club has been in encouraging sponsors to come forward—not just local hobby shops, but some big names, too. V.P. Charles Roberts encourages everyone to support these sponsors and he sent thank-you letters signed by all entrants to all the stores and companies who contributed those hard-earned prizes. (Incidentally, Charles won the event.) Everyone enjoyed the *2x3-foot* Redneck Chocolate Chip Cookie baked by Christine Liberman.

John Brent's highly informative article, "The Aerodynamics of a Turn" will, we're sure, be useful to all members, and we hope there was a good turnout for the club's meeting on August 1st when Robert Hyatt was scheduled to speak on radio installation.

We're delighted to award the club the usual two subscriptions to *MAN*, and we're very glad *we* aren't the ones who'll decide who gets them, because choosing two out of so many true team players isn't going to be easy. Congratulations! Hope you left 'em sockless in Leeds! ■

to a crawl, making spot-landing very easy.

My only concern during this flight was that the Shuemann planform wing looked as if it was prone to tip-stalling; the Shuemann tips don't seem to like being flown too slowly while turning. This shouldn't be too much of a problem, though, as long as the pilot is aware of this tendency and keeps the air speed up while thermal-turning. Overall, the Winsome looked pretty impressive. I'll let you know when Larry goes into production, as I'm sure the Winsome will be very popular.

Computerized Radios

Several types of computerized radios are now available: Airtronics*, Futaba* and JR* all have models for different types of flying. At present, only Airtronics, with the Vision, makes a computerized radio just for soaring enthusiasts, but Futaba is working on a computerized glider radio, and if all goes well, it should be available some time next year.

The biggest problem for most of us is coming up with the bucks for one of these great radios, especially if we bought the Airtronics 7SP Module last year (the only glider radio then available with all kinds of mixing capabilities). The ATRCS computer system that's in the Airtronics Vision was originally developed for the 7SP, so if you own an Airtronics 7SP radio and you can't justify the purchase of a new Vision, why not retrofit it with the ATRCS computer?

And to show that they're really on the ball, the geniuses at Control Systems Laboratories* have come up with a software update that will give your old 7SP virtually the same capabilities as the new Vision. This update can also be retrofitted to previously modified 7SPs for a nominal charge. For more information, get in touch with CSL.

Till next time ... good thermals and a full charge!

**Here are the addresses and phone numbers pertinent to this article:*
Cal Drake: *(805) 995-1672.*
William Vogelsang, *5933 Mayhill Dr., Madison, WI 53711.*
Boyd O'Brien, *P.O. Box 7153, Metaire, LA 70010. (504) 835-5212.*
Ben Mathews, *101 Mulberry Dr., Metaire, LA 70005. (504) 833-5589.*
Bob Kopski, *25 West End Dr., Lansdale, PA 19446.*
Frank Korman, *5834 Goodwin, Dallas, TX 75206. (214) 821-0393.*
LJM Associates, *1300 Bay Ridge Rd., Appleton, WI 54915.*
Airtronics Inc., *11 Autry, Irvine, CA 92718.*
Futaba Corp. of America, *4 Studebaker, Irvine, CA 92718.*
JR Radio; *distributed by Hobby Dynamics, 4105 Fieldstone, Champaign, IL 61821.*
Control Systems Laboratories, *238 Hillview Dr., Milipitas, CA 95035. (408) 946-4142.* ■

GOLDEN AGE

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had surprised many with it at the '53 Nats. The article explains the aerodynamics of and the symmetrical airfoil needed and used for inverted flight. *Now* we know that much that was then thought vital is really inconsequential. A special fuel tank was thought to be necessary for inverted flight, and one with a "swivel" pickup was

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GOLDEN AGE

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successful. Now *all* R/C tanks can be flown inverted! The cute part was the claim that with the Over and Under, inverted flight, outside loops, figure-8s, etc., were now possible, but it was apparently recognized that pilots would also have to learn how to perform these, and the procedure for each one was explained.

The O&U actually performed as claimed so easily that I came to expect such success, but not so with the rest of R/C. It was a couple more years before the market would allow dmeco (my company) to exploit the design and produce the L.W. Sonic Cruiser kit.

Also in the same issue of *Air Trails* was an article by Dr. Walter Good, who prophesied what R/C would be like in the future. Want to see how good a psychic Walt was? (Remember, this was before the transistor and Ni-Cds.) Walt's extrapolations were based on activity beginning in 1949 (the Nats had 30 entrants, all single-channel, and all were on "ham" frequencies); then he looked at the '53 Nats (140 entrants, some reed multi-channels and 90 percent were on the new license-free frequencies). He observed two trends at the '53 Nats: the O&U, which, as I've described, pointed the way to fully aerobatic craft; and a fine, flying, *scale* biplane by Warren Carter that heralded the arrival of scale R/C. From these starting points, Walt threw caution to the wind and predicted several things:

First, he said that the '54 Nats would see over 200 entrants, and I think it did, so it was the first *real* headache for the organizers. Obviously, this growth continues today, with the addition of pylon and scale to pattern. Walt also thought that rudder-only would continue for several years for the majority. Unfortunately, he wasn't optimistic enough, as multi-reeds "exploded" almost immediately!

Walt's prediction that R/C planes would be classed according to the number of controls probably led the AMA to change the rules and establish rudder-only, intermediate and multi—classes that continued for several years. Walt also suggested that multi would be dominated by *small models* using ingenious methods to get multi controls. At the time, reed development was embryonic, and he really had no way of predicting the rapid improvement and growth that would occur with them.

Walt very accurately predicted that pattern designs would soon follow C/L stunt in design configuration. Impressed

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GOLDEN AGE

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by the O&U's inverted performance, he thought it rather obvious that C/L stunt pointed the way to complete maneuverability. This prophecy has yet to be fulfilled as far as basic layouts are concerned, but his suggestion that maneuvering "flaps" would be necessary hasn't proven to be true because of the limited room in R/C planes.

Next, Walt emphasized that the time had arrived for scale R/C to come into its own; multi-reeds allowed that. It's just too bad he wasn't aware of what had happened at Purdue University, or he might also have envisioned *giant* scale!

One prophecy that failed to materialize was Walt's thought that R/C *combat* would prove attractive. I guess that even a *simple* model isn't considered expendable by most R/Cers. Perhaps this was best for R/C; consider the ramifications of combat flying!

Walt's final prediction was the most visionary: He said that R/C helicopters would become a reality. He thought reeds would be sufficient to control them, but we now know that R/C 'copters required much more development and proportional control before flying successfully, many years later.

In general, it seems that Dr. Good's '54 prophecy came close to describing modern R/C. He only missed R/C "jets," but let's face it, even full-scale jets had a long way to go at that time! I wonder if he could ever have anticipated the sophistication, reliability and low cost of the equipment that we enjoy today. Would anyone care to stick his neck out and prophesy what R/C will be like 35 years *from now?* Some say we're close to the ultimate, but are we really? ■

READERS' REPORTS!

We'd like you to participate in our "Readers' Reports" program, which was established to give you an opportunity to voice your opinion on products you've used. The guidelines are easy: Just send us a brief 3 or 4 paragraphs and a picture or two of any kit you've built or have underway. Tell us what you thought. If we use your report with one of our regular "Field and Bench" reviews of the same product, we'll award you a complimentary subscription to *MAN*. It's that easy. Participate! Make your views known.

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